

# 100 ÅR MED YDELSESKONTROL



## 1895–1995

UDGIVET AF LANDSUDVALGET FOR KVÆG



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YDELSESKONTROL

1895-1995



100 År Med Ydelseskontrol 1895–1995

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*Emil Konradi - Danmarks første kontrolassistent  
Emil Konradi - The first milk recorder in Denmark  
- and in the whole world!*

# Forord

Med dr. Gerbers opfindelse for godt 100 år siden af sit enkle, sikre og først og fremmest transportable udstyr til fedtbestemmelse i mælk åbnedes for en eksplosiv udvikling.

Beslutningen om at starte Vejen og Omegns Kontrolforening viste sig hurtigt at være af skelsættende betydning for ikke bare Danmarks mælkeproducenter, men dannede forbillede langt ud over landets grænser.

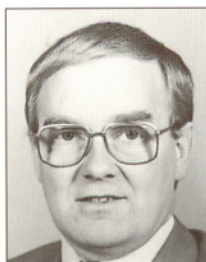
Såvel den dato, hvor den stiftende generalforsamling blev holdt, nemlig den 24. januar 1895, som dagen for den første ydelseskontrol, der var den 29. april, er ligeværdige datoer at markere 100-års jubilæet på. Den 29. april blev valgt for at undgå risikoen for, at selve jubilæumsarrangementet forstyrres af vejrguderne.

I dette jubilæumsskrift har en række forfattere bidraget dels med korte historiske oversigter, dels med aktuelle artikler, der klart dokumenterer ydelseskontrollens helt centrale placering i moderne kvægavl og -produktion samt i kvægbrugernes driftsledelse anno 1995.

Landsudvalget for Kvæg har derfor fundet det helt naturligt at markere 100-års jubilæet for ydelseskontrollens indførelse i kvægbruget.

Det er håbet, at dette jubilæumsskrift vil kunne inspirere læserne i såvel Danmark som i udlandet til fortsat at forbedre ydelseskontrollen og de afledte funktioner til gavn for mælkeproducenterne, hvor de end befinder sig.

*April 1995*



*Henrik Nygaard  
Chefkonsulent  
Landskontoret for Kvæg*





Af landskonsulent Arne Nielsen,  
Landskontoret for Kvæg

Det initiativ, som de 13 bønder på Vejen-egnen tog med dannelsen af verdens første kontrolforening i 1895, viste sig hurtigt at være kimen til en landøkonomisk aktivitet af uvurderlig betydning for kvægbruget i alle udviklede lande. Der var dog naturligvis mange årsager, som tilsammen gjorde, at ideen fægede så hurtigt.

Men danske bønder var jo ikke alene de første, som startede en kontrolforening. Det var også danske bønder, der som de første startede en kvægavlsforening med kunstig sædooverføring. Dette, og meget andet, hvor danske bønder tog sagen i egen hånd og ved samarbejde iværksatte aktiviteter til fælles gavn uden smålig skelen til ejendomsstørrelse, eller om den ene eller anden fik flere eller færre fordele, vidner om en allerede dengang oplyst og veluddannet bondestand.

Denne bondestand magtede dengang at realisere tankerne og etablere velfungerende organisationer uden lovgivningsmagts pålæg herom, men dog ofte med statsstøtte. Og dette har danske bønder gjort mange gange siden da.

Eksempler på sådanne aktiviteter, udover kontrolforeningerne, er andelsmejerier, andelslagterier, foderstofforretninger, gødningsforretninger og en helt uvildig rådgivningstjeneste drevet af brugerne selv.

# Ydelseskontrol i 100 år

Værdien af disse initiativer er i dag, at det er de danske bønder selv, der er de økonomisk ansvarlige hele vejen fra produkternes „conception to consumption“. Der er ingen udefra kommende kapitalinteresser, som kræver sin part af det økonomiske udbytte! Ydelseskontrollen af malkekvæg, som i dag på helt frivillig basis omfatter ca. 86% af alle malkekøer i Danmark, er for så vidt blot en af disse aktiviteter. Men alligevel!

Ydelseskontrollen er i dag fundamentet i kvægdatabase, som i sin udformning er ganske unik.

Nogle få andre lande har også en central kvægdatabase, men ingen har endnu formået at få etableret et så bredt samarbejde om den, som tilfældet er i Danmark. Det skyldes uden tvivl det foran beskrevne.

Værdien af denne kvægdatabase

for nutidens besætningsejere lader sig ikke kort beskrive. Men dens betydning i bestræbelserne for at sikre hver enkelt kvægbruger et effektivt servicetilbud er uvurderlig.

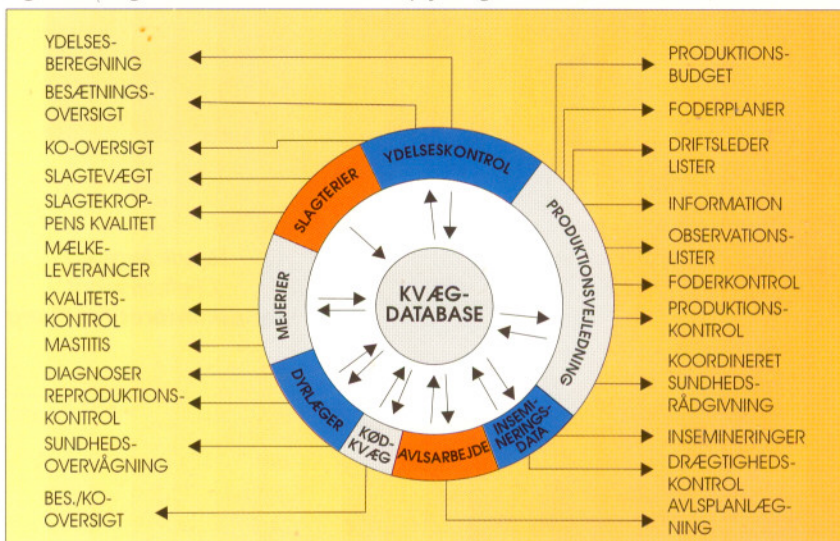
## Den historiske udvikling

En tilbundsgående og videnskabelig korrekt historisk beskrivelse af udviklingen i de forløbne 100 år er ikke mulig inden for de i dette jubilæumsskrift givne rammer.

Derfor koncentrerer bestræbelserne i det følgende om en summarisk redegørelse for den historiske udvikling inden for tre hovedområder:

- Kontrolforeningernes virke
- De danske kontrolforeningers Landsudvalg
- Det internationale samarbejde.

Figur 1. Kvægdatabase fundament er oplysninger indsendt af kontrolassistenterne





## Kontrolforeningernes virke

Allerede få år efter starten i 1895 påbegyndtes en landsdækkende indsamling af statistiske oplysninger om ydelsesresultater, medlemsantal og koantal m.m. Der foreligger derfor et betydeligt publiceret materiale om kontrolforeningernes aktiviteter og resultater, blandt andet „Oversigt over regnskabsresultater i de danske kontrolforeninger,” vol. 1-38 v. konsulent Tage Andersen, Roskilde (1), hvortil særligt interesserede må henvises for detaljestudier. Enkelte markante udviklingsforløb bør dog nævnes her.

Antallet af kontrolforeninger steg hurtigt i århundredets begyndelse og nåede sit højdepunkt i 1939/40, hvor der er registreret i alt 1.817 kontrolforeninger. Dette store antal var naturligvis en følge, dels af datidens begrænsede tekniske muligheder (fedtbestemmelsen efter gerbermetoden foregik jo på gården med anvendelse af den transportable centrifuge), dels af det faktum, at hovedparten af besætningerne kontrolleredes efter metode A, d.v.s. med assistenten som prøveudtager.

Som et lille kuriosum kan nævnes, at i de første år var antal medlemmer pr. forening næsten et helligt tal, nemlig 13 - så kunne assistenten kontrollere 13 dage og holde hver anden søndag fri. Det vil sige, man startede med kontrol hver 14. dag. Men det varede dog ikke længe, før 3-ugers kontrol var det almindelige. Senere forlængedes intervallerne, og den

udvikling er ikke stoppet endnu. De første 50 år af de danske kontrolforeningers virke var naturligvis præget af de to verdenskrige, hvor fodersituationen var yderst vanskelig. Derimellem gennemlevedes tredivernes økonomiske krise, som fik mange til at ophøre med ydelseskontrol. Disse første 50 år er i øvrigt glimrende beskrevet af den første kontrolassistent, Emil Konradi.

Beskrivelsen findes i værket „Eliten af danske kvægopdrættere og kvægracer,” bind I, Jylland, Killigrens forlag 1949 (2). Særlig interesserede henvises hertil.

Emil Konradi, der var uddannet mejerist, var kontrolassistent i Vejen og Omegns Kontrolforening i 3<sup>o</sup> år, før han tog på Landbohøjskolen og senere fik sin livsgerning som lærer på Ladelund Landbrugsskole.

Fra Konradis beskrivelse af kontrolforeningernes første 50 år bør dog fremhæves to af de deri omtalte emner:

Allerede i oktober måned 1897 - altså blot 2<sup>o</sup> år efter starten i Vejen - foranledigede Foreningen af jyske Landboforeningers regnskabsudvalg (!!!) indkaldt til det første fællesmøde for kontrolforeningernes formænd og assistenter. Dette udvalg, som blev nedsat ved delegeretmødet i 1896, havde den kendte organisationsmand Anders Nielsen, Svejstrup Østergaard, som formand, og var kontrolforeningssagen til stor støtte i begyndelsen (2).

Regnskabsudvalget arrangerede således fællesmøderne for de jyske kontrolforeninger i 14 år indtil 1911, hvor de ændredes til

det jyske kvægavlsmøde, arrangeret af Foreningen af jyske Landboforeningers Husdyrbrugsudvalg. Set i historiens bakspejl kan man godt undre sig over, at netop dette udvalg først så sent kom på banen, men det synes som om, udvalget primært arbejdede med hesteavl og stambogsføring. Møderne gennemførtes så årligt i denne form, til Landsudvalget for Kvæg overtog arrangementet med sit første årsmøde i 1972.

Det andet emne, Emil Konradi omtaler, viser, at kontrolforeningssagen helt fra sin spæde begyndelse har været internationalt orienteret. I 1911 afholdtes den 5. Internationale Mejerikongres. Det skete i Stockholm med overværelse af repræsentanter fra næsten alle europæiske lande samt Amerika og Japan! Emil Konradi bidrog med et indlæg om kontrolforeningsarbejdet. Hans konklusioner var følgende (3).

- 1) *Kontrollen giver oplysning om, hvor stort udbytte af mælk, smør og tilvækst der fås for 100 F.E.*
- 2) *Kontrollen belyser dyrets brugsværdi og bruges som et væsentligt grundlag ved valg af avlsdyr.*
- 3) *Kontrollen fremhjælper landmændenes regnskabsvæsen.*
- 4) *Alle grene i bedriften bør efterhånden indgå i kontrollen, så hver enkelt landmand opnår en fuldstændig oversigt over den indre omsætning i sin bedrift.*
- 5) *Kontrollen opnås foreningsvis med de færrest mulige omkostninger.*



Kongressen drøftede indgående kontrolforeningernes betydning og vedtog efterfølgende resolution, som i grunden gav kontrolforeningsarbejdet ridderslaget, som det uundværlige hjælpemiddel, det var i kvægavlens og kvægbrugets tjeneste - og som det fortsat er.

Resolutionen lød (3).

*„På grund af de udmærkede resultater, som er opnået af kontrolforeningerne i Danmark, Sverige, Norge, Nederlandene, Tyskland, Finland og Østrig, erklærer den 5. Internationale Mejerikongres, at kontrolforeningerne er et af de bedste hjælpemidler til at fremhjælpe malkekvægavlen, til at bidrage til en formindskelse af omkostningerne ved mælkeproduktionen og til at højne denne. Endvidere fæster Kongressen opmærk-*

*somheden på kontrolforeningernes store betydning for indførelsen af en rationel og økonomisk fodring og et ordnet bogførings-system og ligeledes på deres betydning for udbredelsen af kendskab om de værdifulde forsøg, der gøres på husdyrbrugets område“.*

I årene siden da er ydelseskontrollens tekniske gennemførelse og udnyttelsen af datamængderne derfra sofistikeret meget, for mange nok i overvældende grad. Men alle vi, der nu i en årrække har været engageret i dette arbejde på den ene eller anden måde, bør nok i en stille stund stille os selv det spørgsmål: Hvor meget originalt nyt har vi kunnet bidrage med?

Set på baggrund af det netop beskrevne er der vist mest tale om, at udviklingen af nye tekniske hjælpemidler har givet os mu-

ligheder i hænde, som vore forgængere ikke havde. Det fundamentale er ikke tilført afgørende nyt, hvilket understreger den fremsynethed, stifterne var i besiddelse af.

### **Hvordan har tilslutningen udviklet sig?**

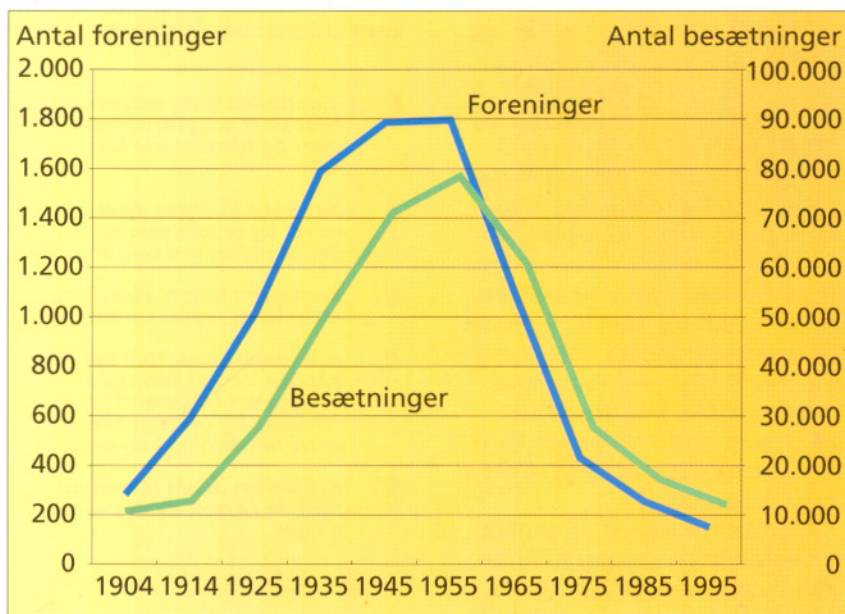
I fyrreerne og halvtredserne var antallet af kontrolforeninger næsten konstant, hvorefter rationaliseringsmulighederne med central fedtbestemmelse og EDB-behandling af kontrolregnskaberne hurtigt resulterede i et fald. I 1994 er antallet af foreninger således ned på 60, hvilket er det mindste antal, der er registreret i dette århundrede.

Antallet af tilsluttede besætninger nåede sit højdepunkt i 1957, altså nogenlunde samtidig med at foreningsantallet begyndte at vige.

Den største tilslutning til ydelseskontrollen målt på koantal opnåedes i 1954 med ca. 875.000 køer. Siden slutningen af halvtredserne er antallet af kontrollerede besætninger faldet med 85%, men koantallet kun med 30%, hvoraf følger, at koantallet pr. besætning er undergået en drastisk forandring i de seneste 40 år, nemlig fra 11 køer pr. medlem til nu 51!

Den drastiske udvikling, som figur 2 og 3 viser, afspejler de store forandringer, dansk kvægbrug af flere årsager har gennemlevet i årene siden 2. Verdenskrig. Mange opgav kvæghold til fordel for en svinebesætning blandt andet som led i en specialisering. Produktionsvilkårene for kvægbruget var særdeles vanskelige som følge af vanskelige eksportbetingelser til vore nabolande mod syd efter

Figur 2. Antal Foreninger og besætninger





Fællesmarkedets oprettelse og i årene indtil Danmarks indtræden i 1972. Køernes vandring mod vest accelererede o.s.v.

Billedet ser anderledes positivt ud, når udviklingen i ydelsen analyseres. På dette område er der virkelig tale om en produktivitet fremgang af en størrelse, som ingen kunne forudse.

Den sande værdi for besætnings-ejeren af en frivillig, landøkonomisk aktivitet lader sig dog ikke måle ved ydelsesresultater, køer pr. besætning, antal foreninger eller lignende, selv om sådanne opgørelser også er vigtige.

Det centrale spørgsmål må være, om landmændene føler, at de tilbud, ydelseskontrollen kommer med, er af en sådan lødighed, at den enkelte besætningsejer føler, han få valuta for pengene.

Andelen af ydelseskontrollere-de køer er derfor det bedst tænkelige udtryk for, hvorledes besætningsejerne i almindelighed vurderer udbyttet.

Som det ses, har tilslutningen aldrig været større, og det skal i den forbindelse understreges, at ydelseskontrollen i Danmark er et helt brugerbetalt servicetilbud.

En række faktorer har hver for sig øvet sin indflydelse på stigninger i tilslutningen. Nævnes bør proteinbestemmelsen, der indførtes, da mælkens proteinværdi fik stigende betydning i mejeriernes afregningspolitik, og celletællingerne, som ligeledes indførtes som en funktion af stigende krav fra mejerierne.

En anden faktor er også vigtig, nemlig ydelseskontrolresultaterne som baggrund for de forskellige driftsledelsværktøjer. Rådgivningstjenesten tilbyder nu en bred vifte af disse, men fælles for

dem er, at de kun kan udnyttes, såfremt grundlaget er til stede, nemlig en sikkert gennemført ydelseskontrol med hurtigt ajourførte beregninger og adgang til de opdaterede besætningsdata for alle relevante kredse. Deri er intet nyt, det var jo netop en af begrundelserne for starten i 1895, men på dette område er der sket en rivende udvikling i årene siden 2. Verdenskrig.

#### **Kontrolassistenternes rolle**

En ikke verificeret, men hyggelig historie vil vide, at fru Anine Hansen, Askov Forsøgsstation, var den person, der foreslog, at man kaldte den, der skulle ansættes i kontrolforeningen til at udføre arbejdet for en kontrolassistent. Sikker er det imidlertid, at navnet er lige så gammelt som kontrolforeningerne.

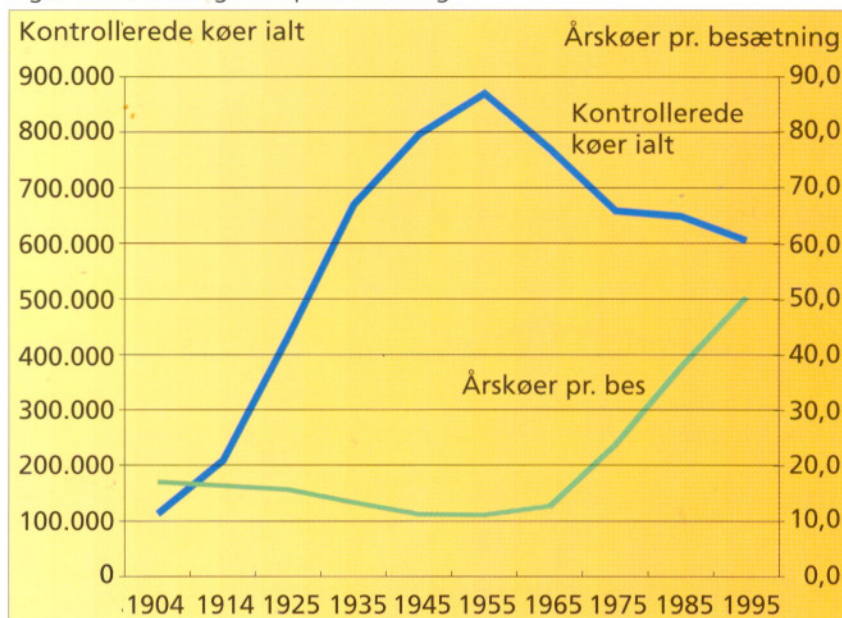
I de mange år, indtil centralgerberering indførtes, og forenings-

sammenlægningerne derefter tog fart, er det ikke forkert at sige, at kontrolforeningerne stod og faldt med kontrolassistentens personlighed og med det arbejde, han udførte for og i foreningen. Det var i mangfoldige år et endog yderst agtværdigt job at være kontrolassistent.

En munter historie fra det fynske vil vide, at rangfølgen i sognet var: Præst, degn, kontrolassistent, bytyr!

Kontrolassistenternes folkelige betydning er ikke blevet meget beskrevet. Men den var stor, såfremt assistenten besad kvaliteterne, hvad alle dog naturligvis ikke gjorde. Det var i mange år et særdeles værdifuldt led i mange landmænds uddannelse at virke en periode som kontrolassistent. Det gav god færdighed i talbehandling og en god indsigt i de forskellige medlemmers driftslederevner

Figur 3. Koantal og køer pr. besætning





og deres måde at behandle dyr og mennesker på. Det var derfor meget lærerigt for de assistenter, som evnede at drage nytte af det, de oplevede. Derfor så man da også, at mange af de ledende landmænd i organisationerne og i det politiske liv - samt som kvægopdrættere - havde virket som kontrolassistenter i en periode.

En detalje, set med nutiden øjne, men som var meget betydningsfuld for mange unge landmandsfamilier, var, at kontrolassistenten var den eneste, der kom på gårdene og havde en bismervægt. Derfor var det almindeligt, at han vejede de små børn og dermed var med til at følge deres udvikling. På en måde var han datidens sundhedsplejerske. Vægten var et klenodie, så assistenten og

familien kom tæt på hinanden på denne måde. Man levede med i hinandens glæder og sorger i de små samfund!

Tidligere tiders kontrolregler foreskrev, at besætningsejeren ikke måtte få at vide i forvejen, hvilken dag kontrolassistenten kom. Det var i bund og grund en uløselig opgave, da assistenten jo skulle bo på gården. Der findes sikkert utallige historier om, hvorledes dette løstes. En version, fortalt af den sidste formand i De danske kontrolforeningers Landsudvalg, Poul H. Andreasen, Karise, lyder således: Assistenten spørger: „Er du hjemme på torsdag?“ „Ja,“ lød svaret. „Er XX også hjemme?“ „Ja, det er han.“ „Jamen, det er godt,“ siger assistenten. „Jeg ved, at YY også er hjemme. Vi skal jo

helst være fire til en L'HOMBRE.“ !

Med de større foreninger fulgte en ændring, som mange assistenter så frem til, nemlig de, som gerne ville fortsætte som kontrolassistenter, og som derfor ønskede en fast bopæl. Rundt om i landet har mange kontrolassistenter senere fejret 25-års jubilæer og er med rette blevet fejret af medlemmerne i sognets forsamlingshus.

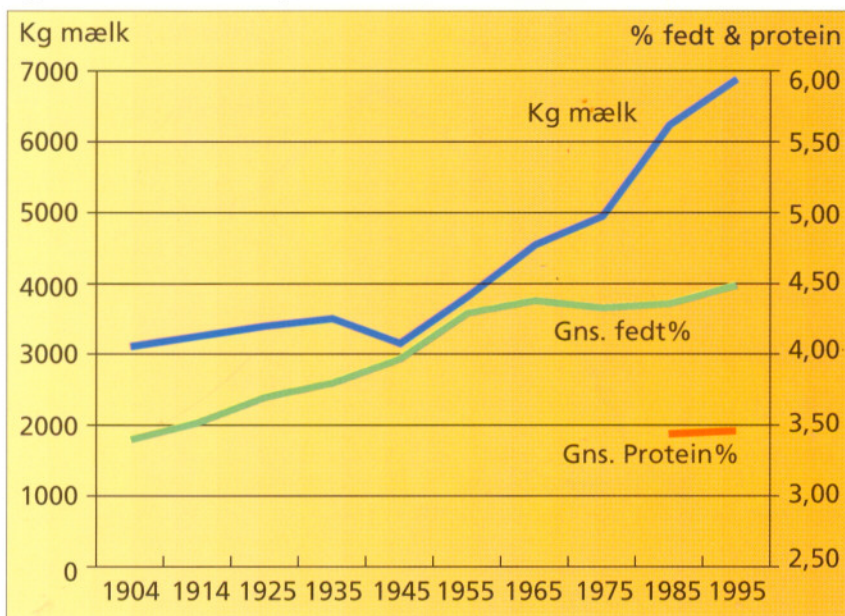
Arbejdsbetingelserne for kontrolassistenterne er meget anderledes nu, men stadig kommer de tæt på landmandens måde at drive sit kvægbrug og behandle sine dyr på, så der stilles de samme krav som før om loyalitet og evne til ikke at løbe med sladder, men forbindelsen til husmoderen og børnene er forsvundet.

I kontrolforeningernes barndom var kontrolassistenterne også fodringsrådgivere, og kontrolregnskabet indeholdt tillige et foderregnskab pr. ko. Det var fra begyndelsen en rigtig tanke, og regnskabet var baseret på fodringsrådgivning og en foderplan.

Denne del af kontrolforeningernes virke udviklede sig med tiden i en helt forkert retning, idet foderregnskabet efterhånden blev en ren taleksercits, som alene viste, hvad køerne ifølge professor Lars Frederiksen's fodernormer burde have fået af foder. Om de havde fået det eller ej, stod i de fleste tilfælde hen i det uvisse.

Om årsagen var manglende opbakning fra medlemmerne, fra foreningens ledelse eller mangel på rådgivningsinteresse fra kontrolassistenten er uvist.

Figur 4. Ydelsesudviklingen siden 1904





Men kontrolforeningerne tabte denne vigtige del af arbejdet på gulvet, og nutidens kvægbrugsrådgivning, ledet af kvægbrugsudvalg, voksede frem. Baggrunden for denne rådgivning er naturligvis stadig ydelseskontrollens arbejde.

### De danske kontrolforeningers Landsudvalg

Som tidligere omtalt blev der allerede 2° år efter den første kontrolforenings etablering arrangeret et fællesmøde for de jyske kontrolforeninger. Dette og de følgende 14 møder var arrangeret i Foreningen af jyske Landboforeningers regnskabsudvalgs regi - derefter overtog Husdyrbrugsudvalget ansvaret.

På Sjælland, Lolland-Falster, Bornholm og Fyn valgte man en lidt anden model med en egentlig samvirksomhed. Som eksempel nævnes Sjælland.

Også her var initiativet landboforeningernes, idet man i september 1899 indbød til et møde, hvor forslag til vedtægter for virksomheden „De sammensluttede sjællandske kontrolforeninger“ blev forelagt. Samvirksomheden sorterede under De samvirkende Landboforeninger i Sjællands Stift. Samvirksomheden blev herefter dannet den 22. maj 1900.

Set i bakspejlet er det bemærkelsesværdigt, at man så få år efter den første kontrolforenings dannelse har følt et behov for

samarbejde. De gamle protokoller afslører hvorfor. Sagen var i al sin enkelhed, at da det hele jo var ganske nyt, stod alle famlende, og der opstod en næsten babylonisk forvirring med hensyn til antal kontrolleringer, uddannelse af kontrolassistenter, regnskabsmæssige spørgsmål, tekniske spørgsmål, indkøb af tryksager, syre og amlalkohol etc. etc.

Der var nok at tage fat på. En af de første aftaler, man indgik, var med Steins Kemiske Laboratorium. Kontrolforeningerne og Steins Laboratorium har altså kendt hinanden i næsten 100 år.

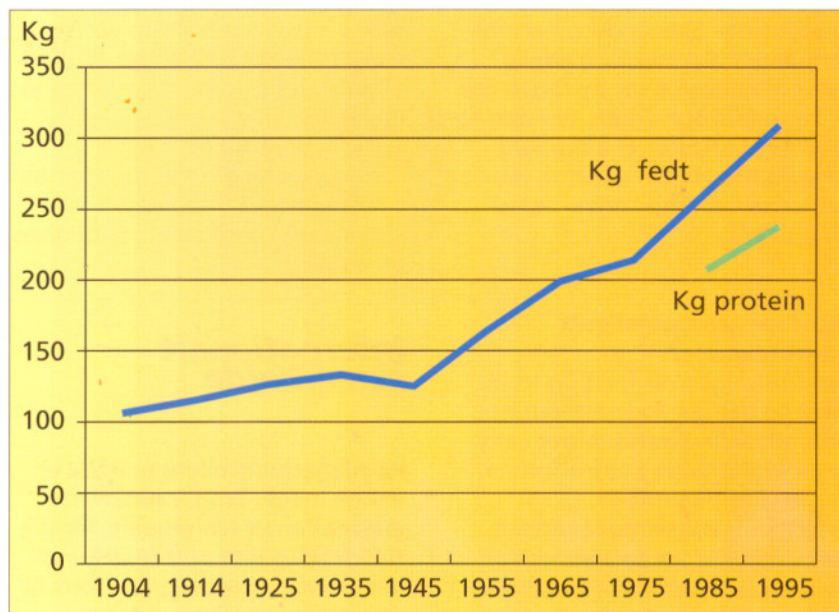
Det provinsielle arbejde var af meget stor betydning og fik, så vidt det kan udledes af de forskellige kilder, etableret et fællesskab

omkring regnskabsføring, krav til assistenternes uddannelse og kvaliteten af deres arbejde samt afholdelse af årsmøder, hvor aktuelle emner blev belyst.

Imellem provinserne ses der at have været nogen kontakt (3), men ikke egentligt samarbejde. Det indledtes først i 1932/33.

**Dannelsen af De danske kontrolforeningers Landsudvalg**  
Beklageligvis savnes forhandlingsprotokollen fra dette udvalg, men med baggrund i forhandlingsprotokollen fra De sammensluttede sjællandske Kontrolforeninger (4) og beretning fra samme organisations årsmøde den 17. - 18. november 1933 ses, at Landsudvalget er dannet i kontrolåret 1932/33.

Figur 5. Ydelsesudviklingen siden 1904, kg fedt og protein





Dermed indledtes et landsdækkende samarbejde, som fungerede uafbrudt, indtil Landsudvalget blev nedlagt og dets arbejde overtaget af Landsudvalget for Kvægs Udvalg for Kontrolforeningsvirksomhed i 1972.

De danske kontrolforeningers Landsudvalg var et samarbejdsorgan imellem følgende:

- Foreningen af jyske Landboforeninger.
- Fællesledelsen af kvægavls- og kontrolforeninger i Fyns Stift.
- De samvirkende Lolland-Falsterske Kontrolforeninger.
- De sammensluttede Bornholmske Kontrolforeninger.
- De sammenluttede Sjællandske Kontrolforeninger.

Landsudvalgets kontoradresse var i alle dets funktionsår De sammensluttede Sjællandske Kontrolforeninger. Sekretær og daglig leder af kontoret var de første fire år konsulent H.P. Olsen, der den 1. april 1937 afløstes af konsulent Tage Andersen, der varetog jobbet indtil Landsudvalgets opløsning i 1972.

#### **Hvad var Landsudvalgets hovedopgaver?**

Landsudvalget var først og fremmest de danske kontrolforeningers officielle repræsentant i alle sager vedrørende kontrolforeningerne i ind- og udland.

Kontrolassistentuddannelsen, deres arbejds- og ansættelsesforhold var dernæst arbejdsopgaver, som man ofrede megen opmærk-

somhed. Nævnes bør i den forbindelse, at Landsudvalget godkendte „Lærebog for kontrolassistenter“, hvis første udgaver udarbejdedes af konsulent Schmelling, Århus. Udarbejdelsen og udgivelsen overtoges senere af Landsudvalget.

Det område, hvor omverdenen nok mest bemærkede Landsudvalgets virksomhed, var igennem den årlige „Oversigt over regnskabsresultater i de danske kontrolforeninger“, der i mange år, udover den danske udgave, også fra umiddelbart efter krigen publiceredes på såvel tysk som engelsk, og sendtes til alle de mange foreninger, institutioner og enkeltpersoner rundt i verden, som Landsudvalget havde kontakt med.

Derved spredtes på veldokumenteret vis kendskab til dansk kvægavls produktionsresultater, som givetvis har haft sin del af æren for, at blandt andet avlsdyr-eksporten har kunnet bevares i så mange år.

Disse beretninger i oversat form blev den direkte forløber for Landsudvalget for Kvægs årlige „Summary“, som nu alene udgives på engelsk.

#### **Internationalt samarbejde**

På ydelseskontrollens område er der en meget lang tradition for internationalt samarbejde. På et tidligt tidspunkt opstod akkurat det samme ønske om, på tværs af grænserne i Europa, at kunne

sammenligne ydelsesresultater m.m., som opstod imellem landdelene i Danmark, og som resulterede i dannelsen af De danske kontrolforeningers Landsudvalg. Sammenligningsmuligheder på tværs af grænser er selvsagt også kun til stede, når resultaterne er fremkommet med brug af ensartet metodik i videste forstand.

Allerede i 1923 blev disse spørgsmål rejst på en international landbrugskongres i Paris (5). På denne kongres vedtoges følgende udtalelse: „Med hensyn til mælke-/smørfedtkontrol af malkekøer er der behov for en standardisering af kontrolprocedurerne imellem de europæiske lande. I særdeleshed bør det anbefales, at mælke- og smørfedydelsesresultaterne udtrykkes i samme form.“

Som skrevet i „Milk Recording in top form for its hundreth Birthday!“ (5) af Mr. Cattin-Vidal, præsident for ICRPMA (senere omdøbt til ICAR), Paris, 1990, så rejste „så fremragende kvægavlseksperter som Dr. Hansen, Berlin, Axel Appel, Århus, og J. Mesdag, Leewarden, Holland“ samme år præcis det samme spørgsmål i Haag, Holland.

Alligevel fortsatte de enkelte lande ufortrødent med deres meget forskellige kontrolintervaller samt lidt forskellige laktationslængder - og for blandt andet Danmarks vedkommende kontrolregnskabsår.

I 1930, på en kongres i Liege i Belgien, foresloges endnu engang, at man gjorde noget ved sagen.

I 1935 var det oppe igen! Stadig var der debat om kontrolintervaller og mange forsøg gennem-



førtes til afklaring af hvilket interval, der gav det mest korrekte resultat. Lige så var der kontroverser omkring beregningsmetoder. I 1931 afholdtes en international Dairy Congress i København (5), hvor der dog kom lidt mere konkrete forslag på bordet. Forslagene, der dog ikke i kilden (5) er specificerede, drøftedes på en senere kongres i samme forum i Prag og Budapest.

Det nævnes af Cattin-Vidal (5), at man er løbet ind i en eller anden form for konflikt mellem ydelseskontrol- og stambogsføringsinteresser. Denne konflikt er ikke løst helt endnu i 1995, hvor der stadig i mange lande er stambogsselskaber, der lever af registreringsafgifter, som er ganske overflødige udgifter for de berørte kvægbrugere. De oplysninger, der betaler for at få registreret, fremgår klart og tydeligt af ydelseskontrollens databaser! Danmark har lykkeligvis undgået denne dobbeltregistrering og dobbeltbetaling.

Så kom 2. Verdenskrig - og alt gik i stå - undtagen de med krigen forbundne aktiviteter. Og dog!

Megen tankevirkosomhed og lyst til at gøre fremskridt på alle områder over grænserne var oplobet, da krigen sluttede i 1945. Allerede 23.-25. april 1947 holdtes et meget vigtigt møde i F.A.O.'s regi i Rom. Resultatet blev en analyse eller undersøgelse af hvilke ydelseskontrolmetoder, der anvendtes i de europæiske lande.

Desuden blev en kommission nedsat, som fik til opgave at analysere standardiseringsmulighederne på basis af den omtalte un-

dersøgelseres resultater. I december 1947 mødtes kommissionen og udarbejdede et forslag, som sendtes til alle F.A.O.'s medlemslande. Forslaget blev desuden præsenteret på en europæisk kongres i september 1949. På basis af disse aktiviteter nedsattes en ekspertgruppe på syv medlemmer, imellem disse Tage Andersen, De danske kontrolforeningers Landsudvalg, samt fem observatører, heriblandt kontorchef H. Ærsøe, Landøkonomisk Forsøgslaboratorium (senere Statens Husdyrbrugsforsøg).

Efter en „drægtighedsperiode“ på næsten 30 år så en international organisation med den opgave at standardisere ydelseskontrolmetoderne i videste forstand så endelig dagens lys i dagene 5.-9. marts 1951 på et møde i Rom.

Det første egentlige møde i den „Europæiske ydelseskontrol Committee“ blev holdt i Haag, i det hollandske landbrugsministerium.

Organisationens sekretariat placeredes i Rom sammen med EAAP (European Association of Animal Production), hvor det siden har været. EAAP's fremragende generalsekretær, Dr. K. Kállay, blev også den første generalsekretær for ydelseskontrolorganisationen.

Danmark var, som det er fremgået, med blandt grundlæggerne.

Siden International Committee for Animal Recording (ICAR), som blev organisationens formentlig blivende navn omkring 1990, blev dannet, er holdt 29 såkaldte sessioner. De holdes nu hvert andet år, men er kun to gange holdt uden

for Europa, nemlig i Israel i 1974 og i Canada i 1994.

ICAR, der nu har næsten 40 lande som medlem, har opnået status som en international organisation med afgørende indflydelse på alle spørgsmål i relation til ydelses- og tilvækstkontrol og dermed relaterede spørgsmål.

Standardiseringen af ydelseskontrollen var opgaven. Den er løst, men efterhånden som ICAR ændrede status fra en europæisk til en egentlig international organisation, måtte hensyn tages til de praktiske muligheder i de nytilkomne lande. Der er derfor nu en længere række godkendte ydelseskontrolmetoder, som er vel beskrevne, og som derfor giver sammenlignelige resultater, når grundlaget angives.

Andre opgaver, som er løst, er godkendelsesprocedurer (herunder definition og kontrol af målenøjagtighed) for mælkemålere samt metodebeskrivelser for laboratorier, der foretager fedt-/proteinbestemmelser. Desuden er der taget opgaver op vedrørende tilvækstkontrol, samt ydelseskontrolstandards for geder.

Det meste af arbejdet foregår i arbejdsgrupper imellem sessionerne, men arbejdsgrupperne nedsættes på de ordinære sessioner. Når en arbejdsgruppe har løst sin opgave, nedlægges den typisk, eller hvis der fortsat er kontrolfunktioner/godkendelsesprocedurer at varetage af betydende omfang, ophøjes den til en stående underkomité, som det f.eks. er sket for arbejdsgruppen vedrørende mælkemålere.



En anden underkomité under ICAR er Interbull, som netop nu er ved at kunne præsentere de første grænseoverskridende afkomsundersøgelser for tyre. Dette har været savnet i årtier! For fremtiden vil udvekslingen af avlsmateriale, derfor i langt højere grad end hidtil kunne ske på basis af videnskabeligt foretagne analyser fremfor salgsmateriale udformet alene af smarte PR-folk.

Når det nu kan lade sig gøre, er årsagen først og fremmest, at de mål, som de fremsynede, europæiske forskere og ledende personligheder i ydelseskontrol-

organisationerne satte sig for mange år siden, nu ved 100-års jubilæet i meget vid udstrækning er nået.

De aktiviteter og den landøkonomiske virksomhed, hvis grundlag blev lagt ved julefesten i 1894, og som førte til dannelsen af Vejen og Omegns Kontrolforening den 24. januar 1895, har derfor fået en betydning, som sikkert ville være ufattelig for initiativtagere, hvis de få fra dengang kunne se det, vi i dag betragter som et naturligt hjælpemiddel.

Det er værd at fejre, og nutidens kvægbrugere i alle ICAR-medlemslande er disse mænd - og den ene dame! - stor tak skyldig. ■

#### Kilder

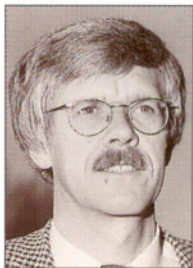
- 1) *Oversigt over regnskabsresultater i de danske kontrolforeninger. Vol. 1-38. De danske Kontrolforeningers Landsudvalg, Roskilde.*
- 2) *Eliten af danske kvægopdrættere og kvæggracer. Bind 1 Jylland, Killigrens Forlag, Herning 1949 PP 9-22. Emil Konradi: Kontrolforeningernes historiske udvikling.*
- 3) *Som 2, PP 23-24. Emil Konradi: Kontrolforeningerne 1895-1945.*
- 4) *De sammensluttede Sjællandske Kontrolforeninger. Forhandlingsprotokol 1931-1933*
- 5) *Milkrecording in top form for its hundredth Birthday. Pierre Cattin-Vidal, Præsident for ICAR, Paris 1990.*











Af Wim M.G. Wismans,  
præsident for ICAR

### Den internationale historiske baggrund

Fra midten af det 19. århundrede, og i tiltagende grad henimod århundredskiftet, begyndte landbrugsbedrifter, institutter og husdyrproduktionsforeninger i Europa og USA at gennemføre „prøvemalkninger“ med henblik på at finde de bedste avlsdyr. Foreninger som „Holstein-Friesian Association“ i USA (start i 1883) og den hollandske stambogsforening for sortbroget malkekvæg (fra 1893) gennemførte også prøveudtagninger.

Professor André Max Leroy fastslår i én af sine mange bøger, at det nøjagtige tidspunkt for ydelseskontrollens oprindelse var det øjeblik, hvor det blev muligt at gå fra daglige prøver til periodiske prøver. Denne mulighed påvistes af Fleischmann og hans medarbejdere på grundlag af ni års forsøg med en besætning på 60 malkekøer. Deres konklusioner blev første gang omsat til praksis den 29. april 1895 i Vejen, som ligger på den jyske halvø i Danmark.

Dermed var „mælk- og smørkontrollen“ kommet til verden. Ikke blot i begyndelsen af ydelseskontrollens eksistens, men også op gennem ydelseskontrollens lange historie, har Danmark ydet et aktivt og stærkt påskønnet bidrag til udviklingen af ydelseskon-

# Kontrollforeningernes betydning for verdens malkekvægproduktion

trollens praktiske gennemførlighed. Efter forskellige tilpasninger og forbedringer overtog man efterhånden også ydelseskontrolsystemet i Sverige, Tyskland og Holland, hvorefter det gradvist blev udbredt til alle andre lande med en økonomisk betydende mælkeproduktion.

I Danmark var der tre år efter oprettelsen af den første kontrolforening i Vejen 45.000 ydelseskontrollede køer; i 1912 var tallet nået op på 200.000 ud af en samlet ko-population på ca. én million. Et imponerende resultat. Danmark lå langt foran andre lande, der havde indført ydelseskontrolsystemet.

Metoderne var dog endnu ikke lagt helt fast, og der var mange kontroverser med hensyn til de fejl, der opstod som følge af indførelsen af periodiske prøveudtagninger i modsætning til daglige prøver. Helt igennem fantastiske tal blev præsenteret med påstande om en fejlmargen på 15% ved månedlige prøveudtagninger. Ved pålidelige forsøg fremkom dog de følgende resultater:

Ugentlige prøver	Prøver to gange månedligt	Prøver med 21 dages mellemrum	Månedlige prøver
+1,04%	+1,48%	+2,08%	+2,68%

Faktisk valgte man i de lande, hvor man havde forstået ydelseskontrollens gavnlige virkninger, intervaller, der svingede mellem syv dage og to måneder, alt afhængig af de, mål man satte sig, og de stedlige forhold. Hvor kontrollen fandt sted med kortere mellemrum, blev den almindelig-

vis foretaget af landmanden selv, hvorimod det som regel var en uddannet kontrolassistent, der foretog kontrollen, når der var længere mellemrum mellem prøveudtagningerne. Mange steder valgte man en kombination af disse to muligheder, hvor landmanden så udførte hyppige prøveudtagninger, og en uddannet assistent gennemførte mindre hyppige kontrolprøver.

Nøgleværdien på det tidspunkt var mælkefedtindholdet, eller mere præcist, smørfedt. Man var også begyndt at diskutere måling af mælketørstof og kasein.

Så tidligt som i 1923 gjorde de lande, som havde oprettet et ydelseskontrolsystem, allerede forsøg på at finde frem til en standardisering af afprøvningsmetoderne og måden at udtrykke resultaterne på.

Men ydelseskontrolsystemet gjorde fremskridt, og i en første vurdering af situationen, som den så ud på verdensplan, og som offentliggjordes af „International Institute of Agriculture“ i 1924 under titlen „Dairy Cow Recor-

ding in Different Countries“ (Kontrol af malkekøer i forskellige lande) blev der opregnet tyve lande med ydelseskontrol. Disse lande havde tilsammen 1,8 millioner ydelseskontrollerede køer.

Elleve år senere, i 1935, udgav det samme „International Institute of Agriculture“ en opdateret



vurdering med titlen „Dairy Cow Recording Worldwide“ (Kontrol af malkekøer på verdensplan). Man havde nu indført et ydelseskontrolsystem i 34 lande, der omfattede 14.000 aktive kontrolassistenter, 285.000 besætninger og 4,5 millioner køer.

Efter at der havde været gjort mange forsøg på at standardisere ydelseskontrolmetoderne, blev der i 1949 nedsat en ny gruppe eksperter, der skulle udarbejde et endegyldigt forslag til udsendelse til de forskellige landes kontrolforeninger.

Gruppen udarbejdede et udkast til en aftale, som blev sendt til godkendelse i alle lande. Gruppen foreslog ligeledes, at man skulle oprette en „Europæisk Komité for Ydelseskontrol“, som skulle bestå af repræsentanter for de organisationer, som underskrev aftalen.

Efter en „drægtighedsperiode“ på næsten tredive år så en International Organisation til harmonisering af ydelseskontrol- og beregningsmetoderne samt formuleringen af resultaterne endelig dagens lys mellem den 5. og 9. marts 1951 i Rom.

Den „Europæiske Komité for Ydelseskontrol“ (mælk- og smørydelse) holdt således sit første møde i det hollandske landbrugsministerium i Haag den 14. juli 1951.

I 1970 ændredes navnet til „International Committee for Recording the Productivity of Milk Animals“ (ICRPMA) (den internationale komité til kontrol af malke dyrs produktivitet).

Aktiviteterne koncentrerede sig om ydelseskontrolsystemer indtil

1982, hvor der i Århus for første gang blev fremlagt forslag om en kødydelseskontrol. I 1983 blev der med den danske Arne Nielsen som formand nedsat en arbejdsgruppe vedrørende identifikation. I 1988 oprettede ICRPMA et underudvalg, som skulle arbejde med godkendelse af ydelseskontroludstyr. Dette var et vigtigt historisk skridt. ICRPMA's godkendelsesprocedurer blev tiltrådt af alle medlemslande.

Det næste skridt var, at Interbull arbejdsgruppen under IDF, EAAP og ICRPMA blev omdannet til et underudvalg under ICRPMA.

I 1990 blev navnet igen ændret, eftersom flere kontrolområder var kommet til sammen med får og geder. Det blev besluttet at ændre ICRPMA til ICAR - „International Committee for Animal Recording“ (den internationale komité for ydelseskontrol inden for husdyrbrug).

I 1980 begyndte ICAR at offentliggøre aktuelle tal om ydelseskontrollens situationen i medlemsorganisationerne. Tallene fra 1974 og 1993 er et udtryk for ydelseskontrollens voksende betydning. Tal fra Danmark, Tyskland, Sverige og Holland er angivet i tabel 1.

Generelt kan der konkluderes følgende:

- *Kontrol af mælkeydelsen er stadig det vigtigste arbejdsområde inden for data-registrering vedrørende dyr.*
  - *A4-systemet (kontrol foretages hver 4. uge/måned af kontrolassistent) er det mest anvendte system. I de skandinaviske lande er B-systemet (gør det selv-ydelseskontrol) det mest anvendte.*
  - *Statsstøtten og mælkeproduktionsindustriens støtte er vigende over hele verden.*
  - *Køernes produktivitet er blevet stærkt forøget (ca. 100 kg/kolår).*
  - *Kontrolforeningernes servicetilbud er blevet forøget, og omkostningerne udtrykt i kg mælk er for det meste gået ned.*
- Verdens malkekvægproduktion**  
I 1992 lå antallet af mælkeproducerende køer på 225 millioner, som tilsammen producerede 450.000.000 tons mælk. I gennemsnit var produktionen på 2.000 kg pr. ko. I ICAR-medlemslandene er gennemsnitsproduktionen på over 5.000 kg. Med andre ord - 20% af verdens ko-population producerer 50% af verdens mælkeproduktion.
- Ser man på forskellene i de enkelte lande, kan det også konkluderes, at de ydelseskontrollerede køers produktivitet er meget højere end produktiviteten hos køer, der ikke er omfattet af ydelseskontrollen. Forskellene ligger for det meste på over 1.000 kg og i nogen tilfælde på over 2.000 kg.
- *ICAR er blevet en egentlig international organisation, og særlig inden for mælkeydelseskontrolsystemerne findes der nu standarder på verdensplan.*



Derudover er der forskelle i mælkenes kvalitet. (Ydelseskontrollerede køer har de højeste fedt- og proteinprocenter og de laveste celletal).

På grundlag af kontrolforeningernes tiltag kan og vil landmændene opnå en forbedring af køernes produktivitet. I dag tillægges mælkekvaliteten stor betydning, og denne betydning vil fortsat stige. Som en følge af behovet for miljøvenlig produktion og kendskabet til at produktionen vil stige, stilles kontrolforeningerne over for en ny udfordring om at støtte landmændene i bestræbelserne på at højne produktionskvaliteten og samtidig bibeholde lave omkostninger.

I udviklingslandene er der et presserende behov for en stadig forbedring af mælkeproduktionen og produktiviteten. Ydelseskontrol kunne være den teknologi, der spillede hovedrollen/førte an i bestræbelserne på at forbedre landbrugsdriften i udviklingslandene. I 1994 besluttede ICAR, at en særlig ekspertgruppe skal udarbejde et forslag til, hvordan ICAR kan igangsætte eller yde støtte til, at der indføres ydelseskontrolsystemer i udviklingslandene.

#### **Fordele ved ydelseskontrollen**

Der er i det store og hele kun én grund til at gennemføre ydelseskontrol, og det er at støtte landmanden i styringen af hans bedrift. Dette omfatter også den viden, som avlsværdital kan give. Kontrolforeninger skal arbejde effektivt.

I mange lande fik kontrolforeningerne før i tiden statsstøtte. I virkeligheden er subsidiering af ydelseskontrollens driftsomkostninger ikke noget gode, når det gælder om at øge effektivitet og samarbejde. Statsstøtte til iganghjælpning af en ny udvikling kan derimod kun hilses velkommen.

Hvis identifikation og registrering (I&R) af dyr ikke fandtes, kunne driftsstyringstiltag og avlsplaner ikke bringes til at fungere. Sammen med stambogsforeningerne har kontrolforeningerne gjort sig store anstrengelser for at kunne opretholde et godt I&R-system. Desuden er samarbejdet med sundhedsmyndighederne, som det finder sted i Danmark og Holland, et absolut „must“.

Et andet vigtigt punkt er arbejdets kvalitet. Opstår der fejl i ydelseskontrollarbejdet, kan disse ikke senere rettes, selv ikke ved hjælp af komplicerede statistiske modeller. Kvalitetskontrol udgør derfor en væsentlig del af arbejdet, og kontrolforeningerne skal indberette deres resultater til et organ, der fører tilsyn med ydelseskontrolsystemet.

I de nye retningslinjer fra ICAR findes et afsnit om tilsyn med ydelseskontrollen. Dette udgør en begyndelse. Der skal udarbejdes kvalitetskontrolsystemer og regler vedr. internationalt tilsyn.

At der er behov for ydelseskontrol kan ikke diskuteres. I en situation, hvor køerne producerer 7.500 kg mælk og omkostningerne i forbindelse med ydelseskontrol kun beløber sig til 50 kg mælk, kan ydelseskontrol kun siges at være virkelig billigt. Ydel-

seskontrolforeningerne kan derfor kun betragte det som en udfordring at kunne yde landmændene sådanne servicetilbud, at landmændene vil være villige til at betale omkostningerne ved ydelseskontrol.

#### **Effektivitet og samarbejde**

Idag kan kontrolforeningerne tilbyde landmændene mange styringsredskaber. Eksempelvis kan nævnes:

- den økonomiske værdi af en ko's produktion i forhold til staldkammeraterne
- avlsværdital
- fodringsrådgivning
- celletal
- kvote-planer
- udsætningsplaner
- reproduktionsplaner
- plan for anvendelse af tyre

På grund af de voksende dyrevelfærdmæssige og miljømæssige krav og den forventede lavere pris på mælk vil fordelene ved landbrugsdrift formindskes. Behovet for at omsætte produktionsdata til økonomiske data vil blive stærkt forøget. Ydelseskontrollen har og vil komme til at spille en rolle som drivkraft i bestræbelserne på at integrere de oplysninger, som forskellige organisationer ligger inde med, til ét styringsredskab.

Ny teknologi (elektronisk) vil få en større og større indflydelse på landbrugsdriften. Divergenserne inden for landbrugsdrift vil derfor tage til. Kontrolforeningerne må være i stand til at tilbyde land-



mændene alternative løsninger, således at landmanden kan gøre brug af det system, der imødekommer hans ønsker.

Når vi ser på denne udvikling, bliver nødvendigheden af et samarbejde landene imellem tydeligt. I praksis vil dette ikke være nogen let sag. Hvert land har sit eget system. Særlig inden for udviklingen af nye redskaber til støtte for landmanden findes der samarbejds muligheder.

#### Afslutning

100 år med ydelseskontrol er en milepæl, der fortjener at blive fejret. Danmark var og er stadig et førende land, når det gælder ydelseskontrolarbejdet. I fortiden er nået meget, og i fremtiden vil der blive behov for at indføre nye metoder og teknikker til støtte for landmanden i styringen af hans bedrift, således at han kan frembringe produkter af høj kvalitet, der sikrer ham fordele ved landbrugsdriften. Det vil være en udfordring for kontrolforeningerne at imødekomme landmandens ønsker med hensyn til samarbejde på nationalt og internationalt niveau.

På vegne af ICAR og dens medlemsorganisationer ønsker jeg kontrolforeningerne til lykke med, at det nu er 100 år siden Vejen og Omegns Kontrolforening blev oprettet. ■

Tabel 1.

ICAR	1974	1993
Medlemmer	21	33
Ydelseskontrollerede køer	9 mio.	25 mio.
<b>Ydelseskontrollerede køer (%)</b>		
Danmark	60	83
Tyskland	40	70
Sverige	53	77
Holland	61	77
<b>Ydelseskontrollsystemer</b>		
Danmark	A4(34);B(55)*	A4(25);B(75)
Tyskland	A4(100)	A4(89);B(11)
Sverige	B(100)	B(100)
Holland	A3(83);A4(17)	A3(23);A4(65)
<b>Ydelseskontrollens pris (A4) (i kg mælk)</b>		
Danmark	60	54(gns.A4 og B)
Tyskland	95	95
Sverige	-	81
Holland	55	54
<b>Statsstøtte (%)</b>		
Danmark	16	0
Tyskland	50	40
Sverige	37	0
Holland	20	0
<b>Kg mælk/ko (ydelseskontrol)</b>		
Danmark	4858	6891
Tyskland	4614	5982
Sverige	5424	7398
Holland	4902	7220

\*) procentandelen er angivet i parentes





Af Holger Busch Nielsen,  
lærer i kvægbrugsfagene,  
Ladelund Landbrugsskole

24. januar 1894 og 29. april 1895 er mærkedage i dansk landbrugs historie. 24. januar holdtes stiftende generalforsamling, og 29. april begyndtes arbejdet i Danmarks og verdens første kontrolforening.

#### Baggrund

1880'erne var for erhvervslivet i Danmark en opgangs- og udviklingstid, det gælder åndsliv, økonomi og teknik. Man oplevede en næsten springvis udvikling på alle områder - også politisk. Enkelte punkter skal nævnes:

Amerikanske jernbaner blev anlagt fra midtstaterne til atlanthavnene. Amerikansk korn kunne importeres til Europa, og kornpriserne faldt overalt i Vesteuropa.

Landbruget måtte i Danmark omlægges fra korn- og studeproduktion til husdyrproduktion; først og fremmest til produktion af mælk og mejeriprodukter, men også til svineproduktion på grundlag af skummetmælk.

Efter 1864 blev en mængde højskoler etableret og besøgte i stort tal af bondesønner, som fik styrket deres selvværd og blev indstillet på at tage vare på egne problemer. I forbindelse med jubilæet må især nævnes, at Rødding Højskole blev flyttet til Askov i 1866. Askov blev model for andre højskoler og fik meget stor betydning for udviklingen i det centrale Sydjylland.

# 100-års jubilæet i Vejen og Omegns Kontrolforening

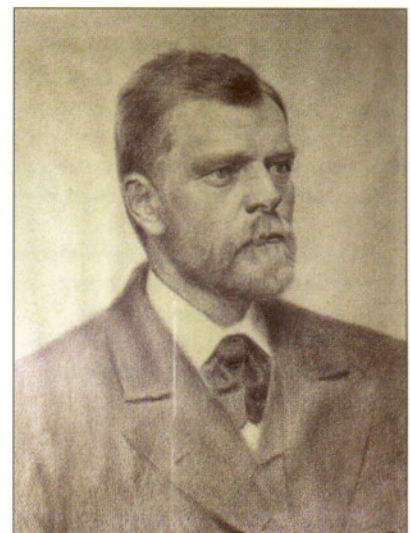
Den tekniske udvikling bestod blandt andet i bygning af de landsdækkende jernbanelinier. Bygning af jernbanen fra Kolding til Esbjerg i 1878 fik meget stor betydning for landbruget som helhed, idet der nu blev mulighed for direkte eksport til England. Lokalt betød den nævnte jernbane, at en række store stationsbyer opstod fra intet. Her nævnes Lunderskov, Vejen, Brørup, Holsted, o.s.v.

Mejeriteknisk var tiden også en gæringstid. Man lærte at køle mælken med is opbevaret fra vinteren, man udviklede bedre metoder til skumning af mælken. Mange større gårde fremstillede smør af udmærket kvalitet. I 1880'erne blev den kontinuerlige centrifuge opfundet. Det hele krævede en vis form for stordrift, som de almindelige bønder ikke magtede. Fællesskab omkring udnyttelse af disse moderne teknikker medførte oprettelse af andelsmejerier. Det første som bekendt i Hjedding i 1882.

Højskoler og folkestyre udviklede en række store personligheder, som interesserede sig for folkets vel (folket var bønderne). Disse personligheder var ofte store landbrugere, præster, højskoleforstandere og landbrugsskoleforstandere. De var katalysatorer for oprettelse af f.eks. de landøkonomiske foreninger. Udviklingen styredes efterhånden i stort omfang af bønderne selv. De blev formænd for landboforeninger, mejerier og sparekasser.

#### Situationen i 1895

En af disse personligheder var forstander Niels Pedersen på Ladelund. Han havde sin baggrund som lærer på Askov Højskole og oprettede Ladelund Landbrugsskole i 1878. Han var foregangsmand på en masse områder. Der blev næppe oprettet et andelsmejeri i 1880'erne, uden at Niels Pedersen var involveret som en art konsulent. Den teknologiske udvikling af mejeribrugget lå Niels Pedersen stærkt på sinde, og hans initiativer blev starten til oprettelse af et forsøgsvæsen. I første omgang var det mælkens fysiske, kemiske og bakteriologiske forhold, der blev undersøgt.



Niels Pedersen.



Her kom docent N.J. Fjord ind i billedet som manden, der kunne løse problemerne. Interessen for mælken forhold førte hurtigt til interesse for køerne og køernes fodring. Dette samarbejde mellem N.J. Fjord og Niels Pedersen førte til oprettelse af Landøkonomisk Forsøgslaboratorium, som senere blev til Statens Husdyrbrugsforsøg.

På andelsmejerierne erfarede man, at „mælk er ikke mælk“. Hovedproduktionen var smør, og man fandt variation i mælkeforbrug til produktion af 1 pund smør fra 45 pund mælk til 18 pund. Vi ved nu, at det med datidens produktionsforhold betød, at fedtprocenten varierede fra ca. 2% til ca. 5%.

Retfærdig afregning af mælken nødvendiggjorde en undersøgelse af værdien af de enkelte leverandørers mælk. Dette førte til udvikling af prøvekærner og til udvikling af apparater til bestemmelse af flødeprocenter. I 1892 udformede dr. N. Gerber i Zürich en fedtbestemmelsesmetode, der var præcis, hurtig, ukompliceret at arbejde med og billig. Gerberereringen var ikke alene anvendelig på leverandørmælken på mejerierne, men også anvendelig på de enkelte køers mælk.

Betaling af mælken efter smørværdi opfordrede i høj grad hver enkelt leverandør til „med flid at lægge vind på at producere fed mælk“. Ved Fjords forsøg blev man opmærksom på, at foderet spillede en vis rolle for mælken sammensætning. Blandt andet gav mask og bæreme tynd mælk, medens palme- og kokoskager

gav fed mælk. Men generelt turde man fastslå, at foderet kun spillede en underordnet rolle for mælken fedtindhold. Køernes evne til at give fed mælk var en individuel egenskab, og som sådan måtte den være arvelig. Derfor var vejen frem at avle sig til federe mælk. Dette kræver kendskab til fedtindhold i de enkelte køers mælk.

Alt dette så Niels Pedersen klart, og han havde siden 1890 ført regnskab over de enkelte køer i Ladelundgårds besætning. Der førtes ikke alene ydelsesregnskab, men også foderregnskab, så produktionsprisen for 1 pund smør kunne beregnes for hver enkelt ko. Han agiterede stærkt for sagen, men en vanskelighed var, at fedtbestemmelsesapparatet var bekosteligt og anvendelse heraf krævede en vis uddannelse. Med andre ord var fedtbestemmelse i mælk noget, der - på samme måde som mejerivæsenet - skulle løses i fællesskab.

Det fortælles, at sagen med koregnskaber drøftedes af Vejenegnens bønder ved julesammenkomsterne i 1894. Fru Anine Hansen (fru Frederik Hansen, Øster Haugård, Askov, nuværende Askov Forsøgsstation), som også interesserede sig for sagen, opfordrede til at standse snakken om sagen og gå til handling.

Det resulterede i, at der indkaldtes til stiftende generalforsamling i „Vejen og Omegns Kontrolforening“ den 24. januar 1895 hos Søren Peter Knudsen på Lille Skovgård. De 13 „større“ bønder med omtrent 300 køer opstillede vedtægter for foreningen og vedtog at gå i gang med arbejdet snarest.

Nogle hovedpunkter i vedtægterne:

- Målet er at danne stammer af køer, der giver megen og fed mælk.
- Foreningen dannes for 5 år, og alle medlemmer er bundet for 5 år.
- Alle mælkeydende køer kontrolleres hver fjortende dag.
- Udgifterne fordeles efter antal fedtbestemmelser.

Der anskaffes et Gerbers apparat og antages en assistent, hvis opgave det er at føre et nøjagtigt regnskab over de enkelte køers mælk, smørudbytte og foderforbrug. Endvidere skal han udarbejde en oversigt over alle individers indbyrdes slægtskabsforhold, så man kan udtage dyr, der har sådan en avlsværdi, at de kan virke forbedrende på den almindelige avl.

Medlemmer var egnens større bøndergårde bl.a. Ladelund, Dorotheasminde, Lille Skovgård, Vandamgård, Grønvang, Askov Højskole og Øster Haugård. Antallet, de 13 medlemmer, var et næsten helligt tal. Det betød, at man kunne kontrollere hver fjortende dag og assistenten holde fri hver anden søndag.

Emil Konradi, som var elev på Ladelund, blev uddannet til arbejdet med prøveudtagning, gerberering og regnskabsføring. Forberedelserne blev gennemført, og 29. april 1895 kontrollerede man første gang hos læge Boe Bojesen på Dorotheasminde.





*Emil Konradi*

Derfor kan denne dag vælges som jubilæumsdagen. Konradi blev aflønnet med 410 kr. for det første år, næste år øgedes lønnen til 505 kr. Konradi blev senere landbrugskandidat og skabte sig derefter en lang karriere som lærer på Ladelund.

### **Den videre udvikling**

Vejen og Omegns Kontrolforening dannede forbillede for hundredvis af foreninger, der meget snart blev oprettet landet over. Allerede samme år, 1895, blev der oprettet kontrolforeninger i blandt andet Askov og Ågård, Brørup fulgte efter i 1896. 1910 var der i alt oprettet over 500 foreninger. De nordiske lande fulgte efter. De øvrige europæiske lande kom senere til og kopierede ideen, omend ofte i statsligt regi.

De høje idealer i Vejen og Omegns Kontrolforening med hensyn til kontrolleringens hyppighed og det omhyggelige foderregnskab kneb det at videreføre i de nytilkomne foreninger. Mange af disse havde 19-20 medlemmer og kontrollerede således kun hver tredje uge.

Man begyndte også at optage husmænd i foreningerne; de måtte selv udtage prøverne og selv veje foderet, hvorefter assistenten gerbererede og førte regnskabet. Der ses også eksempler på, at to småbesætninger delte assistenten og selv udtog prøver hver anden gang.

Når tilstrækkeligt mange kvægholdere meldte sig med ønske om optagelse i kontrolforeningen, oprettedes normalt en ny forening med 13-20 medlemmer. Vejen og Omegns Kontrolforening valgte dog en løsning med to kredse. Indenfor det oprindelige område oprettedes 3-4 andre foreninger, blandt andet Ladelund Kontrolforening. Landbrugsskolen videreførte i første omgang sit eget meget omfattende kontrol- og regnskabsarbejde, men indtrådte senere i den almindelige forening.

De høje idealer videreførtes i Vejen og Omegns Kontrolforening helt frem til 1920'erne. Man ville ikke gå på akkord med det oprindelige mål, nemlig at udarbejde et totalregnskab over hver enkelt ko. I 1899 anskaffedes en kreaturvægt for 160 kr., og man fik den lokale karetmager til at lave en vogn hertil. Man vejede derefter køer, kvier o.s.v. to gange årligt, så man var i stand til at lave et

ordentligt tilvækstregnskab. Vægten fik en selvstændig forening, som finansierede vægten ved optagelse af et 10-årigt lån i sparekassen. Driften klaredes ved opkrævning af 5 øre pr. vejning.

Vægtens kapacitet var så stor, at den kunne udlejes til naboforeningen. Efter at vægten var betalt, fortsatte man opkrævningen og opsparede en renteindtjente kapital, som i 1917 kunne betale en ny vægt og vogn. Endvidere betalte vægtforeningen efter forslag på generalforsamlingen kaffen ved kontrolforeningernes årlige generalforsamling!

Foderregnskabet førtes i foreningerne på baggrund af „prøvevejningen“ af foderet. Man omregnede i foderenheder. Vi skal huske, det er pund-foderenheder. Man benyttede „de almindelige forholdstal“: 1 foderenhed = 1 pund oliekgager = 1 pund korn = 2 pund sødmælk = 6 pund skummetmælk = 10 pund runkelroer eller kålrabi = 12<sup>o</sup> pund turnips = 2-3 pund hø = 4-6 pund halm = 8-12 pund grøntfoder. Afgræsningen beregnedes ofte som 7 foderenheder plus 1,25 FE pr. pund mælk.

*Øverst på næste side (tabel 2.) ses et eksempel på resultatopgørelse fra Vejen og Omegns Kontrolforenings beretning fra 1903-04, 1908-09 og 1921-22, som omfatter de oprindelige 13 medlemmer.*



Tabel 2.

	Mælke og smørudbytte				
	Antal køer i 365 dg.	Pd/kg mælk	Pct. fedt	Pd/kg smør	Pd/kg fedt
1903-04	250	6.715	3,47	259	233
1908-09	257	6.374	3,43	243	219
1921-22	198	3.251	3,78	137	123

	Brugte foderenheder ("pundfoderenheder" / "kg-FE")							
	Oliekager	Andet krtf.	Roer	Græsning	Grønt	Hø	Halm	I alt
1903-04	977	333	921	1.112	259	603	273	4478
1908-09	877	321	1.115	1.353	248	308	319	4541
1921-22	623	84	852	722		70	145	2496

	Daglig pr. ko		100 foderenheder gav				Græs- dage	Gns. vægt, Pd
	Pd/kg mælk	FE	Pd/kg mælk	Pd smør	Pd tilvækst	indt. kr.		
1901-02	18,4	12,3	150	5,79	1,8	6,36	97	909
1908-09	17,5	12,5	139	5,3	1,1	60,9		897
1921-22	8,9	8,2	130	5,5				

(NB: Metrisk system indført i 1912).

### Avlsmæssige fremskridt

Man havde ventet at opnå meget hurtige avlsmæssige fremskridt med hurtig stigning i fedtprocenterne. Man overvurderede den genetiske sammenhæng og undervurderede de miljømæssige forhold, ville man sige i dag. Men fremgang fik man trods alt. Nogle ydelsesresultater fra de 13 besætninger, der var med i 1895, illustrerer forholdene. Det bemærkes hvert år, at samtlige køer er af Rød Dansk Race.

Det samme gælder stort set også naboforeningerne. Men i 1910 og 1912 dukker de første Jerseybesætninger op; de holdes dog uden for gennemsnitsberegningerne på grund af de høje fedtprocenter, henholdsvis 5,21 og 5,45. Frem til omkring 1920 gennemfører næsten alle medlemmer tre gange malkning, derefter bliver der flere og flere, som nøjes med to gange malkning. I 1921 kommer for første gang bemærkninger om maskinmalkning i vinterhalvåret.

Det fremgår af tabellerne, at man havde svært ved at øge mælke-mængden; det gik langt lettere med at øge fedtprocenten, som man lagde stor vægt på. Med nutidens viden om heritabiliteter overrasker det os ikke.

Der var dog også skeptikere, som var bange for den planlagte avlsmæssige udvikling. På dyrskuet i Brørup udtaltes det: „Fremtiden vil bringe os sletbyggede, spidsrøvede individer, hvis ydelsen skal være enegældende ved udvælgelse af tillægsdyr.“

I Vejen og Omegns Kontrolforening tog man allerede i 1896 fat på kontrol af svinehold, hestehold og markdrift, så man stort set havde et regnskab svarende til nutidens bidragsregnskab. Det forklarer også, at man fastholdt den meget lille forening med ca.

Tabel 3.

År	Antal køer	Pund mælk	Pct. fedt	Foderenheder
1985-1900	307	6.172	3,35	4.307
1900-1905	332	6.437	3,44	4.473
1905-1910	333	6.353	3,53	4.676



300 køer og ned til 11 medlemmer. Omkring 1910 ebber den omfattende bogføring af andre driftsgrene ud, og man nøjes her efter med de tre områder.

- Kontrol af ydelse, kg mælk og fedtprocent.
- Kontrol af foderforbrug af de enkelte foderemner.
- Registrering af afstammingsforhold, løbninger og kælvninger.

Så sent som i 1950'erne ophørte foderregnskabet som obligatorisk del af kontrolforeningsarbejdet. Det var blevet meningsløst. Kontrolassistenten beregnede dyrenes foderbehov og noterede ofte uden besætningsejerens medvirken blot et grovfoder- og kraftfoderforbrug, som svarede til dyrenes behov.

### **Finansiering**

Som nævnt finansieredes kontrolforeningernes arbejde ved medlemmernes betaling pr. fedtbestemmelse. Men allerede i det første regnskabsår for Vejen og Omegns Kontrolforening optræder i regnskabet „Bidrag fra Staten“ med 250 kr. Sammenholdt med foreningens samlede udgifter på 714 kr. er det et meget væsentligt tilskud.

De følgende år frem til 1905 øges statsbidraget til 450-500 kr., de samlede udgifter ligger typisk på omkring 1.000 kr. De følgende år frem til 1920 reduceres statsbidraget til 160-190 kr. årligt. I de følgende 15 år reduceres bidraget yderligere, til det i 1935 er på 75 kr. Herefter har kontrolforeningerne kun brugerbetaling, gennem alle årene beregnet pr. fedtbestemmelse. Prisen pr. fedtbestemmelse var i de første år omkring 5 øre; i 30'erne steg prisen til ca. 20 øre.

### **Fællesledelsen**

I 1899 oprettedes Fællesledelsen af Kvægavls- og Kontrolforeninger i Koldingkredsen. Fællesledelsen opstod, som i andre egne af landet, ved et samarbejde mellem landboforeninger, kvægavlsforeninger og kontrolforeninger. Området omfattede den østlige del af Ribe Amt og den sydlige del af Vejle Amt. Målet var at koordinere arbejdet i områdets kvægavlsforeninger og kontrolforeninger. Man ansatte en konsulent, hvis opgave det var at bistå foreningerne med faglig rådgivning om kvægavl, regnskabsføring m.v.

Konsulentens opgave var også at udarbejde beretninger om de opnåede resultater i husdyrbruget. Helt frem til 1960'erne fungerede kontrolforeningerne efter den model, der blev skabt 50 år tidligere. Visse ændringer blev dog indført; først og fremmest accepteres b-kontrol og c-kontrol i større og større omfang, så antal besætninger og antal køer pr. kontrolassistent kunne forøges. De oprettede laboratorier overtog efterhånden gerbereringsarbejdet.

I løbet af 1960'erne indførtes den moderne elektroniske databehandling. Store mængder af rutinemæssige talbehandlinger er velegnet for denne teknik. Kontrolforeningernes talbehandling er i virkeligheden baggrunden for oprettelsen af Landbrugets EDB Center (LEC) i Århus. Alt dette førte efterhånden til en fuldstændig omstrukturering af kontrolforeningsarbejdet.

*En kontrolkasse flyttes med gig fra Fåborg, Varde, 1933*





I Koldingkredsen mødtes man den 13. april 1971 til et møde med henblik på at samle alle kontrolforeninger under fællesledelsen i én forening. Mødet resulterede i, at man 15. juni samme år holdt stiftende generalforsamling i den nye forening, der kom til at hedde „Koldingkredsens Kontrolforening.“ 13 foreninger gik med i den nye forening fra begyndelsen. De øvrige foreninger i området er efterhånden blevet tilsluttet, og sidste forening gik med pr. 1. oktober 1986. Hermed var epoken omkring Vejen og Omegns Kontrolforening slut.

Pr. 1. oktober 1975 afsluttedes endnu en epoke i kontrolforeningernes virke. Assistenterne sluttede med gerberering ude hos medlemmerne; fedtbestemmelserne blev herefter udført med milko-tester på et fælles laboratorium. Koldingkredsens Kontrolforening gik sammen med Kontrolforeningen Vestjylland og etablerede eget laboratorium i Varde.

På laboratorierne havde man også mulighed for proteinbestemmelse i mælken, og den blev indført fra oktober 1978. Siden oktober 1989 har man målt de enkelte køers celletal. Den nuværende stigning i tilslutningen til kontrolforeningsarbejdet skyldes netop, at mælkeproducenterne, som kontrolforeningsmedlemmer, får kendskab til de enkelte køers celletal, hvorved man langt bedre kan styre mælke kvaliteten gennem udsættelse af køer med høje celletal.

Figur 6. (til højre) illustrerer forholdene i Koldingkredsens Kontrolforening. Ydelsestillene er

påvirkede af raceudviklingen. Frem til 1950 var mindst 95% af køerne RDM, ca. 2% Jersey og endnu færre af Sortbroget Jysk Race. I 1995 er fordelingen - som alle andre steder - totalt forandret: 14% RDM, 62% SDM og 17% Jersey.

#### **Kontrolforeningsarbejdets betydning**

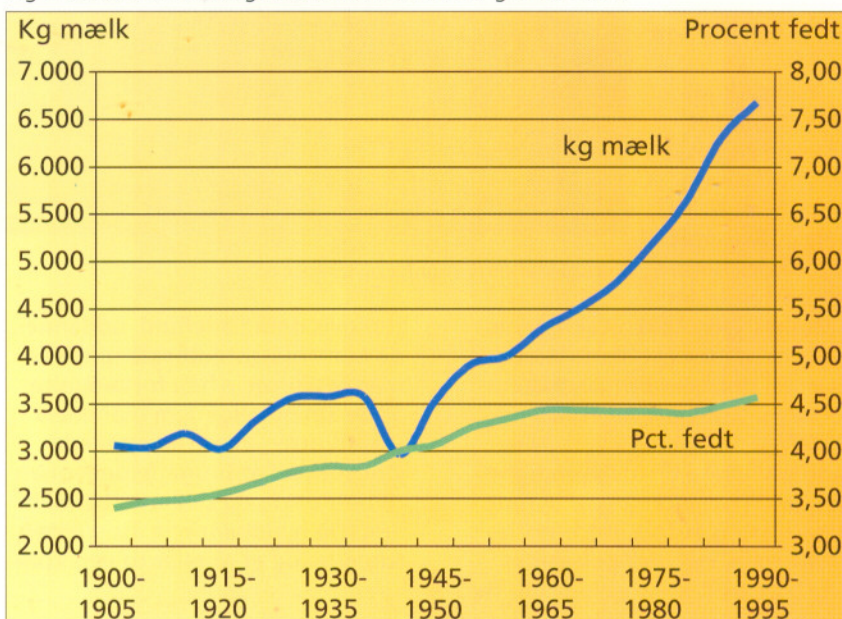
Kontrolforeningsarbejdets mest langsigtede betydning har været at danne grundlag for avlsarbejdet.

Siden 1890'erne har ydelseskontrollen og kvægavlen været tæt forbundne størrelser. Kontrolforeningerne registrerer og bog-

fører de enkelte køers ydelse, registrerer dyrenes afstamning og holder informationerne intakte. Dette gjorde man i 1895, og nøjagtig det samme er det overordnede mål for arbejdet i 1995.

Kvægstambøgerne fra 1890'erne rummer et væld af informationer om dyrene; hovedvægten ligger på opnåede præmier på dyrskuerne. Der er yderst sparsomme oplysninger om køernes ydelse. Ydelsen registreres først og fremmest ved beskrivelse af køernes ydelsespræg: d.v.s. spejlets form og størrelse, mælkeårens udvikling, mælkehuller o.s.v. Vi har svært ved at forestille os, at avl

Figur 6. Ydelsen i Koldingkredsens Kontrolforening 1900 - 1995





efter disse kriterier kunne give nogen fremgang!

I stambøgerne frem til 1910 har stambogskøer i de fleste tilfælde ydelsesoplysninger i form af pund mælk pr. år og gennemsnitlig fedtprocent samt pund smør. Avls-målet var større smørydelse. Man nærrede tilsyneladende blind tillid til det, vi nu kalder genetisk sammenhæng; de fleste tyremødre havde fedtprocenter langt over besætningsgen-nemsnittet, og et meget stort tal af elitetyrene kom fra besætninger med høje gen-nemsnitts-fedtprocenter. Den røde race hentede flere hundrede tyre fra godset Helle-rup på Fyn, hvor man havde fedt-procenter helt op til fire.

Ydelseskontrol har i et vist omfang måttet indrette sig efter kvægavlens behov. Avlsmæssigt er der behov for bestemte foranstaltninger, f.eks. skal dyrene have et utvetydigt identifikationsmærke. Her har kontrolassistenten måttet være kvægavlens forlængede arm og overbevise landmændene om nødvendigheden af CKR-mærkning af dyrene. Registrering af fødselsforløb, kalvestørrelse, m.v. er ligeledes et

eksempel på kvægavlens krav til kontrolforeningernes arbejde. Den slags registreringer er ikke af umiddelbar interesse for den enkelte landmand, men er nødvendige for helheden.

#### **Lokalpolitisk betydning**

Det skal som et kuriosum også nævnes, at kontrolforeningerne har haft en stor lokalpolitisk betydning. Landbrugsskolerne, na-

trolforening og kom i tæt kontakt med medlemmerne og egnenes folk. Når de så etablerede sig, var det kendt, at det var folk, der kunne noget med tal og bogstaver. De blev valgt som formænd for f.eks. gymnastikforeningen, de kom i sognerådet, de blev kontrolbestyrere for den lokale sparekasse, de blev bestyrelsesmedlemmer i andelsmejeriet med meget mere. Helt op til vore dage finder

vi borgmestre med oprindelig baggrund i sognets kontrolforening.

#### **Sammenfatning**

Det arbejde, som Niels Pedersen og Søren Peder Knudsen sammen med de andre fremsynede mænd på Vejenegnen satte i gang i 1895, videreføres stadig 100 år efter. Målet fra 1895 med at skabe en bedre, mere økonomisk ko er det samme i 1995.

Midlerne til at nå målet er meget mere raffinerede nu, men principperne med en solid og grundig registrering i besætningerne er fuldt og helt uændret. Kontrolforeningerne og assistenterne danner stadig grundlaget for kvægavlsarbejdet i Danmark. ■



Kontrolassistent udtager mælkeprøver

turligvis også Ladelund, uddannede kontrolassistenter på specielle månedskurser, ofte i forlængelse af de almindelige fem måneders vinterkurser. Eleverne opnåede stor rutine i at bruge fyldepennen til bogføring og sikker talbehandling. De nyuddannede assistenter tog arbejde et år eller to i en kon-









Af forstander Bent Jensen,  
Vejlbj Landbrugsskole

# Uddannelsen til kontrolassistent igennem 100 år

Det var ikke tilfældigt, at det var på Vejen-egnen, at Danmarks og verdens første kontrolforening blev startet i 1895. Egnen var folkeligt og fagligt velforankret i bl.a. Askov Højskole, Ladelund Landbrugsskole og Askov Forsøgsstation.

Der går en lige linie fra højskolebevægelsen til oprettelse af andelsmejerier og landbrugsfaglige foreninger, eller som det rammende er udtrykt „at der har været gamle højskoleelever, der hele deres liv lyste som fakler over deres sogn og egn“ (1).

Vejen-egnen var et sådant fagligt og folkeligt kraftcenter. Emil Konradi, der var uddannet meje-

rist og senere lærer på Ladelund Landbrugsskole blev den første kontrolassistent.

At det var betydelige krav, der blev stillet til kontrolassistenterne, fremgår af den formålsbeskrivelse, der igennem mange år var gældende for kontrolforeningsarbejdet.

„Kontrolforeningens formål er, gennem planmæssige undersøgelser af mælkemængde, mælkefedme og fodringen af de enkelte køer i besætningen, at belyse og fremme kvægbrugets økonomi samt ved optegnelse af fødsler, afstamning og mærkning af køer og kalve at yde bidrag til avlens fremme“ (2).

## Kontrolassistentuddannelsen indtil ca. 1965

Kontrolassistentens betydning i det landøkonomiske oplysningsarbejde må ikke undervurderes.

Indtil midten af 60'erne, hvor EDB overtog mange af kontrolassistentens funktioner, var han den person, der forbandt teori og praksis gennem sin direkte kontakt med kvægbrugerne.

Selv om det var undtagelsen, fandtes der eksempler på, at kontrolassistenter nærmest fungerede som konsulenter også i områder, der ikke direkte vedrørte kontrolassistentarbejdsområdet f.eks. regnskabsføring.

De allerførste kontrolassistenter havde selvsagt ingen afgangsprøve som kontrolassistent. Ud over et almindeligt landbrugsskoleophold fik de specialuddannelse i brugen af Gerbers fedtbestemmelsesapparat.

Den hurtige udbredelse af kontrolforeningstanken - allerede 10 år efter starten af Vejen og Omegns Kontrolforening var der ca. 300 kontrolforeninger landet over

Afgangsprøve 1929

Afgangsprøve for Kontrolassistenter i Marts 1929.							
Navn		2 Timers Opgaver	4 Timers Opgaver	Middele	Grubere- ring	Skriftlige Arbejder	Overkarakter
Uagaard	Carlo	g+	ug	mg	ug	ug+	-V.C.
Christensen	Marus	mg+	ug	ug+	ug	mg+	S.V.E.
Friis-Sørensen	Søren	mg	ug+	mg+	ug	mg+	S.V.C.
Gilbey	Jacob	ug	ug	ug	ug	mg+	S.V.E.
Liebsen	Ejner	mg	mg+	mg	ug	ug	S.V.E.
Karsen	Martin	mg+	ug+	mg+	mg	mg+	S.V.E.
Lundgaard	Ejner	mg+	mg	mg+	ug+	ug+	S.V.E.
Løgskjøl-Vilsm	Wigo	g	mg+	g+	ug	mg	-V.E.
Olsen	Sigurd	ug	ug	ug	ug	mg+	S.V.E.
Olsen	P. Søgaard	ug	mg+	ug+	ug	mg+	S.V.E.
Pedersen	J.H.B.	mg	ug+	mg+	ug	mg	-V.E.
Pedersen	Ejner	g	g	g+	ug+	mg	-V.E.
Wittorf	Kristian	mg+	mg+	mg+	ug	ug+	-V.E.



nødvendigjorde en speciel assistentuddannelse. Fra omkring århundredskiftet startede mange landbrugsskoler uddannelse af kontrolassistenter. Der viste sig imidlertid hurtigt interessedispositioner med hensyn til kravet om uddannelse hos kontrolassistenterne.

Ved landbrugsskolernes årsmøde i 1902 var emnet til debat. Det blev her hævdet, at der var „en sorgelig mangel på samarbejde mellem skolerne og eksempler på kontrolassistenter, der ikke kunne behandle tal“ (3). På mødet blev det vedtaget, at der på kontrolkursus kun måtte optages elever, der forud havde gennemgået et 5 måneders kursus på landbrugsskole.

Forslaget faldt dog til jorden, idet 2 skoler, der ikke var til stede ikke ville tiltræde forslaget.

Det var karakteristisk, at der var uenighed om kravene til kontrolassistenternes uddannelse. Nogle skoler tilbød uddannelse på korte specialkurser af 1-2 måneders varighed, andre fastholdt, at kontrolassistentuddannelsen skulle være en overbygningsuddannelse efter et landbrugsskoleophold.

Undervisningen på kontrolkursus omfattede fag som regnskabsføring, prøveudtagning og gerberering, skrivning af stamtavle, hovedbøger samt foderplanlægning.

Ved kursusafslutning blev der aflagt prøve med karakterer i følgende fag: regnefærdighed, prøveudtagning og gerberering, almindelig kontrollære, skriftlig arbejde med orden og foderplanlægning.

DE DANSKE KONTROLFORENINGERS  
LANDSUDVALG

## Afgangsbrev

for

fra ..... født 12/2 1939

elev paa

i 9 måneder i tiden fra 3/11 1960 til 31/7 1961

der her har gennemgaaet et kursus til uddannelse af kontrolassistenter.

Efter endt kursus har eleven ved afgangsprøven opnaaet følgende karakterer for

regnefærdighed .....	meget godt
prøveudtagning og gerberering .....	meget godt
skrift og orden .....	meget godt plus
almindelig kontrollære .....	udmærket godt minus
foderberegning .....	udmærket godt minus

Bent Børring Gunnar Petersen Jim Felipsson  
lærere

Karl Pedersen  
censor

M. Rosendal  
forstander

Skolen anser eleven for at være særdeles velegnet til at  
varetage en kontrolassistents gerning.

Ved afgangsprøven benyttes følgende fire karakterbetegnelser: udmærket godt, meget godt, godt og temmelig godt med mellemkarakterer, og der kræves mindst karakteren godt i regnefærdighed og i prøveudtagning og gerberering for bestaaet afgangsprøve.

Ved egnethed benyttes gradbetegnelserne: særdeles velegnet, velegnet eller egnet.

Afgangsprøvebrev



Skema 1. 1/10 1965<sup>1)</sup>, 1956 Ko nr. 78

født 7/9 1950 hos Agren S. \_\_\_\_\_

Fader Wax født 17/10 1947 hos Hans P. Nielsen, Hovinge R/X 238/5

Moder M. 70 født 15/3 1947 hos Agren S. \_\_\_\_\_

Sidste kælvn. d. 16/11 1954. Kælv. 2 gang. Sidste løbn. d. 8/3 1955, ved Bæske f. et. 21-5-46

Indeværende Kælv. d. 12/12 1955. Køn Kvise mærk. 78 anv. lill. fader Bæske f. et. 21-5-46

regnskabsaar d. / 19 \_\_\_\_\_ f. et. 21-5-46

Kontrol-dagens dato	Kontrol-dagens				Periodens			Foderenheder							ialt	
	kg mælk	per. fedt	kg+per. mælk	Mælk-dage	kg mælk	kg smørfedt (2 decim.)	kg smør (2 decim.)	Foder-dage	kraft-foder	rod-frugter	ensilage	hø	halm	græs og grovf.		
1. 16/9	5,7	4,80		3	17	2,2	2,2	3	5	6		3	2	5	21	
2. 18/10	1,0	4,20		30	30	1,26	1,41	30	32	120		24	22	60	258	
3. 19/11				33	47	2,08	2,33	33	37	126		27	24	65	279	
4. 16/12	21,0	5,30		19	399	21,15	23,22	20	187	150	45	36	22		440	
5. 15/1	25,2	5,10		29	446	23,23	26,22	22	254	392	60	92	68	65	931	
6. 13/2	25,0	3,70		30	750	27,76	30,96	30	186	150	60	45	22		463	
7. 18/3	24,0	4,05		111	1927	8,828	99,26	151	651	487	124	172	112	65	1851	
8. 17/4	21,6	4,15		34	816	33,04	37,00	34	216	170	51	51	25		573	
9. 17/5	19,0	3,95		30	648	26,89	30,14	30	192	150	45	26	22		446	
10. 14/6	18,8	3,90		175	3391	14,821	16,640	215	1059	1007	260	259	159	65	2809	
11. 16/7	15,8	4,10		29	551	21,76	24,34	29	120	50		24	22	132	348	
12. 13/8	11,5	4,20		29	545	21,26	23,77	29	120	50		22	156		348	
13. 12/9	6,3	4,60		233	4487	19,123	21,451	273	1299	1107	260	283	203	353	3505	
14. 12/10	3,2	3,20		30	474	19,43	21,77	30	124	48	45		22	91	330	
15. /				30	345	14,49	16,25	30	93	45		24	22	86	270	
16. /				293	5306	22,515	25,233	1516	1200	305	307	247	520		4105	
17. /				30	189	8,69	9,78	30	62	45		24	22	57	210	
18. /				3	10	3,2	3,5	3	2	5		3	2	6	18	
Aarets middelded. 4,25 ialt				326	5505	23,416	26,266	366	1580	1250	305	334	271	593		4333
Løbet d. 31/1, d. 20/2, d. /, d. /, ved <u>Bæske</u> f. 21/5 1946, R/S nr. 4294																
d. /, d. /, d. /, d. /, d. /, ved _____ f. / 19, R/S nr. _____																
d. /, d. /, d. /, d. /, d. /, ved _____ f. / 19, R/S nr. _____																
d. /, d. /, d. /, d. /, d. /, ved _____ f. / 19, R/S nr. _____																
Ydelse i 304 foderdage efter 1. kælvning		antal dage	kg mælk	per. fedt	kg smørfedt (2 decim.)	kg smør (2 decim.)	Vedtegninger									
overført fra forrige regnskabsaar																
+ ydelse i resten af de hele perioder																
304 dage rest																
ialt i 304 foderdage																
Vedtegning om sundhedstilstand, goldning m. v.:																
Præmiering eller kaaring i regnskabsaaret:																
Brystomfang _____ cm, vægt _____ kg																
Afgaaet den _____ / _____ 19 _____ til *):																
*) Ved salg til avl anføres køberens															Ko nr. 78	

Smuk letlæselig håndskrift var et krav til kontrolassistentene

Udover de 5 karakterer blev afgangsbeviset påført én af følgende gradsbetegnelser: særdeles velegnet, velegnet eller egnet, der var skolens karakteristik af elevernes egnethed som kontrol-assistent.

Udover de faglige krav til kontrolassistenten var det vigtigt, at denne var i besiddelse af personlige egenskaber eller sådanne „karakteregenskaber, at han med pålidelighed og akkuratse udfører de ham pålagte arbejder, for dermed står og falder hele nytten og brugbarheden af det talmateriale, der fremkommer gennem kontrolforeningerne“ (2).

I perioden 1930-1960 blev der uddannet et meget stort antal kontrolassistenter. I midten af 40'erne angives det, at der afholdes 40-45 kurser pr. år på 30-35 skoler med et samlet elevtal på ca. 800 (2).

### Kontrolassistentuddannelsen fra 1965

Indtil midten af 60'erne foregik kontrolassistentuddannelsen stort set som beskrevet i det foregående. Indførelsen af EDB var ikke mindre end en revolution i kontrolassistentens arbejde. I løbet af få år blev arbejdet så specialiseret, at der ikke længere var brug for den brede kontrolassistentuddannelse. I forbindelse med at EDB overtog mange af assistentens arbejdsfunktioner, blev foringer sammenlagt og et stort antal assistenter overflødige. Forårsaget af denne beskrevne udvikling ophørte landbrugsskolerne først i 70'erne at uddanne kontrolassistenter.



Efter at der i nogle år ikke havde været uddannet assistenter viste der sig i slutningen af 70'erne behov for uddannelse af et mindre antal kontrolassistenter.

Denne opgave blev overdraget til Vejlbys Landbrugsskole, der i samarbejde med Landskontoret for Kvæg og LEC stod for uddannelsen, der havde en varighed på 6 uger.

Fagene, der blev undervist i, var kontrolregnskab, mælkeanalyse og prøveudtagning, teknik, kontrollære og kvægavl, fodringslære og effektivitetskontrol. Herudover blev der givet karakter for orden med skriftlige arbejder.

I slutningen af 60'erne startede mange foreninger med ansættelse af prøveudtagere uden nogen formel uddannelse. Enkelte af prøveudtagerne er siden blevet fastansatte som assistenter og har suppleret med løbende efteruddannelse.

I 1967 startede landbrugsteknikeruddannelsen på Vejlbys Landbrugsskole. I flere år var kontrol-eksamen en del af husdyrbrugsteknikeruddannelsen. Teknikeruddannelsen er nu en 2-årig videregående uddannelse ovenpå uddannelsen som faglært landmand.

Uddannelsen indeholder ikke direkte „kontrolfag“, men omfatter en videregående uddannelse i de fagområder, der er nødvendige for en tidssvarende servicering af kvægbruget inden for f.eks. produktionsanalyse, produktionsøkonomi, kvægfodring m.v.

### **Kontrolassistenternes efteruddannelse**

Med til billedet af kontrolassistenternes uddannelse hører også en beskrivelse af assistenternes efteruddannelse.

Indtil omkring 1960 foregik kontrolassistenternes efteruddannelse hovedsageligt i de enkelte fællesledelser i form af assistentmøder, hvor områdets konsulenter og de provinsielle fællesledelseskonsulenter fungerede som lærere.

Efter oprettelse af Landsudvalget for Kvæg blev efteruddannelsen tilrettelagt på landsplan i samarbejde med kontrolassistenternes faglige forening.

I mange år afholdtes der todages efteruddannelseskurser på Bygholm Landbrugsskole. I de senere år har kurserne været afholdt på Vejlbys Landbrugsskole.

Som faste punkter på disse efteruddannelseskurser har været indberetningsprocedurer og håndtering af EDB-tekniske hjælpemidler.

Efteruddannelseskurserne, der har en meget stor deltagerkreds, har yderligere betydning for styrkelse af de kollegiale og sociale relationer kontrolassistenterne imellem.

### **Afslutning**

Historien om dansk kvægbrugs udvikling i det 20. århundrede er også historien om kontrolforeningerne og kontrolassistenternes virksomhed.

Til trods for at det i perioder har været svært at finde fælles fodslag om kontrolassistenternes placering i kvægbrugets servicesystem, er det uomtvisteligt, at kontrolassisterne har spillet en vigtig rolle.

I nutidens og fremtidens kvægbrug stilles der nye krav til servicepersonalets uddannelse. Efter en periode med stærk specialisering i kvægbrugets servicefunktioner nærmer vi os igen kravet om alsidighed, hvor det gælder om at kunne servicere kvægbrugerne på flere områder, lige som med de første kontrolforeninger. ■

### **Kilder**

- 1) A. Vedel 1939. *Højskolerne og Folkelivet, Den Danske Folkehøjskole gennem 100 år.* Skandinavisk Bogforlag
- 2) T. Andersen 1944. *Kontrolforeninger, Kvæget, Håndbog for Kvægavlere, bd.2, s. 227-247* Kirkeskovs Forlag
- 3) N. Dyrbye 1969. *Den Danske Landbrugsskole. 100 år.* Konrad Jørgensens Bogtrykkeri.





## De store forandringer i ydelseskontrollen

Af landskonsulent Arne Nielsen,  
Landskontoret for Kvæg

Ibrugtagningen af EDB til behandling af ydelseskontrollens store datamængder, indførelsen af centrallaboratorier samt decentraliseringen af indtastningen og rettel-sesarbejdet var hver for sig store forandringer i kontrolarbejdets daglige rutine.

De indebar alle betydelige rationaliseringsgevinster, og fik stor betydning med hensyn til at kunne tilbyde medlemmerne af kontrolforeningerne ydelseskontrol til en meget billig pris sammenlignet med vore nabolande. Samtidig er efterhånden opnået et kvalitetsniveau og en samhørighed via kvægdatabase med kvægbrugets øvrige servicefaciliteter, som ikke findes tilsvarende i andre lande.

Desuden medførte omlægningerne store ændringer i kontrolassistenternes daglige rutiner, og medførte ganske vist at antallet af assistenter reduceredes, men samtidig at det blev et levebrødsjob at være kontrolassistent. Og tilmed at såvel assistenter som medlemmer blev fritaget for den byrde og de ubehageligheder, der også var forbundet med dagligt at skifte „bopæl“. ■

*I de følgende tre afsnit er disse tre forandringer beskrevet.*

RDM har som de øvrige racer opnået fremragende produktionsegenskaber igennem de 100 år







Af konsulent Peter Axelsen,  
tidligere kontrolassistent

Der var engang (sådan begynder alle gode historier), før vores EDB-alder, da kontrolassistenterne boede på og deltog i livet på gårde, både inde og ude. Assisterne cyklede rundt fra gård til gård, og landmændene flyttede kontrolgrejerne på hestevogn til næste gård på turen. Der skulle redes seng op til assistenten. Mange gange i et koldt og klamt værelse, eller på en sofa i en varm, røgfyldt stue, hvor vi, som det hørte sig til, havde spillet kort hele aftenen.

Jeg mindes en molbo, der, da jeg første gang blev ansat som assistent, forklarede mig, at der var to ting, der var af afgørende betydning for at kunne klare jobbet som assistent. For det første skulle man kunne omgås kvinderne på gården, da man som regel skulle sidde ved spisestuebordet med regnskaberne. For det andet skulle man kunne spille kort, da det jo var god skik, når der var kontrol på gården. Hvis man derudover kunne lave regnskaberne, var det da godt, men en assistent, konerne kunne regne med, kunne altid blive ansat igen!

Da jeg blev træt af at cykle, købte jeg en motorcykel med sidevogn, hvor centrifuge, spande, glas og øvrige grejer lige kunne anbringes. Derfor forsøgte jeg at lave akkord med foreningen om at flytte grejerne, men da det ville medføre, at årskontingentet skul-

## Ydelelseskontrollen får EDB

le stige fra 6,- kr. til 7,- kr. pr. ko, var det udelukket. Derfor fik jeg lov at akkordere med de enkelte landmænd. Det var også en bedre økonomisk ordning for mig, og landmændene syntes, det var billigt. De var glade for at slippe for at skulle ud at køre med gerberkassen. Der var kun to, der ikke ville med i ordningen, plus en der kun ville med, hvis jeg ville spille kort. Så var der jo en mulighed for at tjene pengene igen. Jeg klarede det, både med kvinderne, kortspillet og regnskabet.

### Sammenlægning til større foreninger

Det følgende år blev jeg tilbudt at deltage i et forsøg med at danne en stor forening med ca. 4.000 køer. Fedtbestemmelserne skulle så laves på et mejeri, og regnskaberne føres på et dertil indrettet kontor. Forsøget blev ikke gennemført, da landmændene var bange for smittespredning!

Forsøget blev nu i stedet flyttet til Århusegnen, hvor der blev dannet en forening med ca. 3.000 køer. Der blev lejet lokaler til kontorbrug og til gerberering. Der var varmt vand og varme, så det var en stor forbedring. Der blev ansat tre assistenter, der fik fast bopæl. Den ene assistent skulle lave regnskaberne, de to andre skulle klare markarbejde og gerberering eventuelt med hjælp af prøveudtagere, og der skulle oprettes hovedbøger for alle besætninger.

Konsulent, bestyrelser og vi assistenter diskuterede meget fordele og ulemper ved et sådant foretagende.

Vi assistenter var meget glade ved udsigt til en fast bopæl, og arbejdet kunne måske blive et levebrødsjob. Også det faste sted med varmt vand og opvarmet lokale til gerbereringen, fandt vi meget tiltalende. Hovedbogen, følte alle, var en god ting. Med afstamning rigtigt anført én gang for alle og årlig ajourføring af ydelse og kælvninger var det hele samlet på ét blad pr. ko.

Markassistenter kunne måske få mere tid til at udarbejde foderplaner, lave Eendagsfoderkontrol, justere malkemaskiner og rådgive om bedre hygiejne som kunne føre til en bedre mælke kvalitet. Ligeledes kunne vi måske også være behjælpelig med at finde de rigtige tyre til de rigtige køer.

Landmændene slap jo for transport af kontrolgrejerne og opredning til assistenter, men, men, men det gik ikke så godt som forventet. Én assistent væltede på motorcykel, spildte alle prøverne og brækkede et ben. En anden måtte på sygehus med et blødende mavesår. Men det værste var nok, at den assistent, der skulle føre alle regnskaberne, opgav, tog sit gode tøj og gik, men tog heldigvis sine køer med og fortsatte som assistent på god gammeldags manér, i den forening han kom fra. Så det kunne konstateres, at Murphys lov om, at alt det der kan gå galt gør det, allerede dengang var gældende!

### Det første forsøg med EDB

Forsøget blev så udvidet med en aftale med mejeribrugets hulkortcentral, det senere Landbrugets EDB-Center, om at de skulle køre



regnskaberne. Kun ganske få foreninger var med i denne første aftale om EDB-anvendelse i ydelseskontrollen som indledtes 1. oktober 1956.

Det blev en hård start, vel nok mest fordi starten skete så hovedkulds uden en grundig analyse og planlægning. Starten blev en efterligning af det gamle regnskab, både hvad indberetninger og udskrifter angår. Men vi assistenter gik ind for systemet, da vi slap for utallige tabel aflæsninger og nedskrivning af masser af tal. Samtidig slap vi for den store travlhed i årsopgørelsesperioden.

Vi var også tiltalt af de muligheder, der tegnede sig for hurtigt at kunne få lavet specialopgørelser, f.eks. korttidsopgørelser, sygdomsopgørelse, tvillingefødsler som omfattede alle dyr etc. etc.

Måske blev starten også hård, fordi det var nogle få kontrolforeninger, der begyndte, uden at De danske kontrolforeningers Landsudvalg var med i tilrettelægningsen, men det kom de lidt senere. Der blev herefter nedsat arbejdsgrupper, der skulle udarbejde forslag til forbedringer af hele kontrolforeningsarbejdet.

I marts 1956 blev jeg så ansat på Mejeriernes og Slagteriernes Hulkortcentraler for at være behjælpelig med at køre et rigtigt kontrolregnskab m.m.

Det gik hurtigt med tilgangen af kontrolforeninger. Koantallet steg fra 4.000 til 110.000 køer på bare 2 1/2 år.

Samtidig med at regnskaberne skulle moderniseres, fik vi på Mejeriernes og Slagteriernes Hulkortcentraler problemer med at nå

registreringen af den kraftigt stigende mængde data. Samtidig med, at der blev ansat ca. 30 personer til at taste oplysningerne ind, akkorderede vi med mange af slagterierne, som vi kørte afregninger for, og som havde overskydende hullekapacitet til at hulle ydelsesoplysningerne. Det fungerede på den måde, at vi fremsendte et antal gram prøvemalkningsblade, der svarede til det antal hulkort, de havde lovet at hulle.

Al hulleriet blev senere afløst af optisk læsbar skrift. Der fik jeg fornøjelsen at rejse rundt i Danmark og lære kontrolassistenterne at skrive tal, der var optisk læsbare. Assisterne, der jo var vant til at skrive tal, vrøvlende nok lidt, men fik hurtigt deres koner lært at skrive sådanne tal, så det gik fint.

I starten skulle assistenterne beregne foder- og malkedage. Da det kneb med, at dageantallet altid faldt sammen med årets antal dage, fik vi lavet mulighed for at maskinen på grundlag af kontroldatoerne samt diverse kælvnings-, gold-, indgangs- og afgangsdatoer, kunne beregne dageantal. Og jeg må sige, at selv om assistenter er dygtige, så var maskinen mere sikker til at ramme det rigtige dageantal, selv i skudår.

Udvalgene, der blev nedsat til at udvikle og holde regnskaberne ajourførte, så landmændenes behov var dækket, arbejdede godt, så der var stadigvæk ændringer og forbedringer. Det bevirkede, at jeg i mange år havde fornøjelsen af at skulle orientere assistenter og konsulenter om de nye ting, der kom frem. Det var meget in-

TP overvågning på LEC





spirerende, for var der noget, der ikke var godt nok efter assistenter og konsulents mening, lod de altid falde et par ord om disse ting.

Landmændene skældte ud, hver gang regnskabet blev ændret. Det er ikke altid forandring fryder, selv om det var til noget bedre. Men med lidt forklaring og lidt tilvænnning blev ændringerne altid accepteret.

Mange problemer opstod, og blev løst gennem årene, og det blev for mig 40 begivenhedsrige år.

De, der kender til kontrolregnskabet i dag, vil kunne se, at de fantasier vi gjorde os for 40 år siden, slet ikke slog til. I dag laves der et regnskab, hvor den enkelte landmand kan få lige netop de oplysninger, han selv mener at have brug for, samtidig med at de grundlæggende data for avlsarbejdet er til rådighed.

Det er egentlig utroligt, hvor meget der kan udtrages af de oplysninger, der fremkommer på grundlag af de oplysninger, kontrolassistenterne indsamler til gavn for den enkelte landmand, dansk kvægavl og kvægbrug som helhed. ■







## Centraliseret laborativirksomhed

Af landskonsulent Arne Nielsen,  
Landskontoret for Kvæg

Allerede i slutningen af 1950'erne begyndte der på Bornholm at røre sig tanker om at rationalisere kontrolforeningsarbejdet, specielt fedtbestemmelserne i en større skala end man andre steder i landet arbejdede med (1). Øen havde på dette tidspunkt 26 kontrolforeninger med hver sin assistent. De tanker, man gjorde sig, gik i retning at lade fedtbestemmelserne udføre i fællesskab og samtidig gå over til at benytte prøveudtagerne. Derved regnede man med, at

kunne indskrænke antallet af egentlige kontrolassistenter til fem.

Ejendommeligt nok udkom Nordisk Mejeritidsskrift nr. 7, 1958, med en serie artikler om fordelene ved at oprette centrallaboratorier overalt i Danmark. Disse tanker vandt så megen genklang på Bornholm, at man besluttede at undersøge sagen grundigt, før man traf en endelig beslutning.

Baggrunden for forslaget om centrallaboratorier var, at tiden fandtes moden til at sikre, at der i Danmark kun produceredes hygiejnisk upåklagelig mælk. Som der blev skrevet (1): „Der må overhovedet ikke på noget tidspunkt ha-

ve været for mange bakterier i mælken, og det er både i æstetisk og sundhedsmæssig henseende utilstedeligt, at der laves mejeriprodukter af mælk, der i udvindingøjeblikket har indeholdt mastitisfremkaldende bakterier, eller at der ved urenlig malkning eller dårlig opbevaring af mælken tilføres denne et overmål af colibakterier“.

Det blev også påpeget (1), at hygiejnespørgsmålet kun var et ud af flere spørgsmål, der trængte til løsning. Blandt andet nævntes: Kontrol med at mælken ikke var tilsat bakteriedræbende desinfektionsmidler eller indeholdt restkoncentrationer af antibiotika.

Der var behov for løbende mastitiskontrol. Central gerberering. Proteinbestemmelser. Hygiejnisk/bakteriologisk driftskontrol med de tilknyttede mejerier. Registrering og statistisk behandling af alle tilvejebragte resultatet o.s.v.

Set med nutidens øjne, alle særdeles relevante opgaver, hvoraf nogle først langt senere lod sig løse.

Centrallaboratorieideen i denne beskrivelse og med alle de nævnte opgaver var en original dansk ide. Men dele af de omtalte opgaver var allerede under løsning i Tyskland og Holland.

### Studierejse 1958

I oktober 1958 gennemførtes herefter en studierejse til Tyskland (kontrolforeningen for Slesvig/Holsten i Kiel) og Holland. Sidstnævnte sted studeredes især masseproteinbestemmelser. Deltagerne i studierejsten var repræsentanter for De danske kontrolforenin-

Bestemmelse af urea i mælk ved hjælp af Flow injektion analysen på Steins Laboratorium, Holstebro





gers Landsudvalg, De danske Mejeriers Fællesindkøb, Mejeriernes Arkitektkontor, De sammensluttede bornholmske kontrolforeninger og Mastitislaboratorierne.

Konklusionen på studierejsen var (1), at gerbereringscentraler, som man havde besøgt, var så enkle i princip og indretning, at det hverken økonomisk eller på anden måde kunne afstedkomme synderlig vanskelighed at etablere noget lignende i Danmark.

#### **Central fedtbestemmelse etableredes på Bornholm**

Det konkrete resultat af overvejelserne på Bornholm i sommeren 1958, samt studierejsen som netop

omtalt, blev en aftale imellem De sammensluttede bornholmske kontrolforeninger og Bornholms Andelsmejeri om etablering af et centrallaboratorium til bl.a. fælles fedtbestemmelse. Omkostningerne påtog mejeriet sig - og sådan har det på Bornholm været siden da!

Centrallaboratoriet fungerede godt og til alles tilfredshed. Alle kontrolforeninger gik med fra starten, omend entusiasmen ikke var lige stor hos alle.

Dette centrallaboratorium blev dermed det første i de danske kontrolforeninger, og det fungerede indtil, at man gik over til det mere avancerede Foss-Electric ud-

styr, hvor analysearbejdet flyttede til Ringsted.

Men det bornholmske centrallaboratorium blev dermed forløberen for de centrallaboratorier, man i dag betjener sig af, så ideen blev altså født ganske tidligt. ■

#### **Kilde**

- 1) *Beretning om centraliseret Laboratorievirksomhed*  
Udgiver: De danske Mejeriers Fællesindkøb A.m.b.a., december 1958.

*Analysen af mælkeprøver på Steins Laboratorium, Holstebro*







Af konsulent Povl Solmer Frank,  
Sønderjysk Kontrolforening, Vojens

16. august 1977 mødtes en gruppe på ni mennesker med henblik på en vurdering af mulighederne for en videregående automatisering/rationalisering i forbindelse med opsamling af data i kontrolforeningsarbejdet. Blandt de ni var der repræsentanter fra kontrolforeningerne, LEC (Landbrugets EDB-center), IBM og Foss Electric, Hillerød.

Dagen indledtes med besøg på Sønderjysk Kontrolforenings laboratorium i Ørsted ved Jels, hvor man fra efteråret 1970 havde udført fedt- og proteinbestemmelser (ca. 4.000 pr. dag) fra 85.000 køer i 3.500 besætninger. Man fortsatte med et ca. 3 timer langt møde, hvor al kendt viden omkring dataopsamling og -transmission blev fremlagt. Spektret i emnerne var vidtspændende: Flaskeregistreringsudstyr, elektroniske mælke-målere, koidentifikationssystemer og ikke mindst automatisering af alle dele i kontrolarbejdets data-kæde.

Resultatet af mødet blev, at man i fuld enighed erkendte mulighederne på det tekniske plan, og dermed at de omfattende daglige datamængder udgjorde en basis for at gå ind i arbejdet med udvikling og forberedelse af tekniske systemer til at løse den foreliggende opgave.

Fordelene var indlysende. Man ville helt kunne gå væk fra det arbejdskrævende og trivielle ar-

## Etableringen af TP-stationerne

bejde med optisk læsbare tal. Samtidig ville ekspeditionstiden, fra prøvemalkningsdag til landmandens modtagelse af EDB-udskrifterne, blive halveret til ca. 4-5 dage.

Efter ca. 2 års forberedelser på flere niveauer var man kommet så langt, at der kunne gives startsignal. I sagens natur blev igangsætningen betragtet som et forsøg. Det blev besluttet at starte to forskellige steder. Henholdsvis på Bornholm (november 1979) og i Sønderjylland (april 1980).

I februar-marts 1980 blev der på foranledning af Landsudvalget for Kvæg nedsat et udvalg til belysning af de fremtidige tekniske muligheder i prøvemalkningsudstyr, laboratorieudstyr og benyttelse af datatransmission. En opfølgende rapport (maj 1980) dokumenterede klart det fremadrettede sigte i de to igangsatte forsøg.

I Sønderjylland var man af andre årsager i den situation, at der skulle etableres nye bygningsmæssige rammer. I januar 1980 blev et nyt laboratorium taget i brug, og i april 1980 blev, som tidligere nævnt, TP-funktionen koblet på. (TP-stationer bruges i daglig tale som forkortelse af Tele Processing stationer, altså de direkte opkoblede (on-line) kontorer, som indtaster data fra ydelseskontrollen m.m.)

Som med alt nyt opstod der indkørvanskeligheder - specielt af teknisk art. Med blid tålmodighed og i visse perioder betydelig ekstra arbejdsindsats - i nogle tilfælde langvarig - blev de prekære situationer håndteret.



Indtastning af ydelseskontrolldata





Konvertering til nye EDB-udskrifter i juni 1980 var også medvirkende til, at der opstod nogle problemer.

De tekniske problemer var tilbagevendende henover det første år, men efterhånden som maskinkapaciteten på LEC blev udbygget, og man fik taget bedre styresystemer i brug til at klare en accelererende TP-trafik, gik det bedre.

De i 1977 oprindeligt opstillede forventninger til en hurtigere og mere sikker behandling af data, eliminering af trivialarbejde og en betydelig formindskelse af interval fra prøvemalkningsdag til modtagelse af EDB-udskrifter hos besætningsejere, blev opfyldt efterhånden.

En væsentlig forudsætning for hele den nye procedure var, at der blev benyttet prøvemalkningsblade i stedet for de hæderkronede prøvemalkningsbøger.

Allerede i midten af 70'erne havde man i Sønderjysk Kontrolforening prøvemalkningsblade i anvendelse, og hvor en kopi blev udsendt til besætningsejeren påført fedt- og proteinprocenter. Dette ophørte ved ibrugtagningen af TP-stationen, og blandt nogle var der lidt utilfredshed med dette, som man opfattede som en serviceforringelse.

Efterhånden, som man registrerede en langt hurtigere modtagelse af udskrifterne end tidligere, forstummede utilfredsheden. Hvor der tidligere kunne gå gns. 7-8 dage, inden udskrifterne blev modtaget, skete der nu en reduktion på 4-5 dage, og i nogle tilfælde betydeligt mere.

Overgangen til det nye var na-

turligvis forbundet med betydelige investeringer, men det var forud beregnet, at der skulle kunne opnås økonomisk balance, hvilket kom til at holde stik. En meget omhyggelig omkostningskontrol gjorde dette muligt, selvom man kapacitetsmæssigt med det anskaffede apparatur ville have været i stand til at klare betydeligt større datamængder i Sønderjylland.

I juni 1981 kunne Landsudvalget for Kvæg meddele, at man på basis af indhøstede erfaringer (Bornholm og Sønderjylland) fandt, at TP-indtastningen var anvendelig i kontrolarbejdet under en række givne forudsætninger. En af de store fordele, udover den meget kortere tid mellem prøvemalkning og modtagelse af udskrifter, var, at ansvaret for fejlretninger også decentraliseredes, hvilket også betød en kvalitetsforbedring.

I løbet af de følgende år blev stadig flere data overført via TP Medio 1984 var overgangen gennemført over hele landet.

En udviklings- og etableringsfase på 7 år var afsluttet. Med det nye værktøj på plads var der lukket op for et utal af muligheder for en yderligere udbygning af serviceringen af kvægbruget. ■





Af afdelingsleder Ole Klejs Hansen,  
Landskontoret for Kvæg

Husdyrbrugere har altid ønsket at forbedre kvaliteten af deres dyr. Der har været arbejdet inden for egen besætning i årtusinder, men offentlig, uvildig bedømmelse på tværs af besætninger startede først med dyrskuerne i begyndelsen af 1800-tallet (Randers 1810, Vejle 1824, Maribo 1831). Eksteriør og kødansætning var vigtige egenskaber i datidens kvæghold, som hovedsageligt var til kødproduktion.

Fra midten af 1800-tallet fik mælkeproduktionen stigende betydning. I 1870'erne fremkom flere apparater, som kunne bestemme „flødeindholdet“ i mælken. De var imidlertid besværlige at arbejde med, og gennembruddet kom først med dr. Gerbers apparat, som blev afprøvet af Forsøgslaboratoriet i 1893.

Det første andelsmejeri blev dannet i Hjedding i 1882. På samme tid starter stambogsføring af kvæg i Danmark - den første offentlige stambog udkommer i 1881, og i 1884 dannes de første kvægavlsforeninger (tyreholdsforeninger).

Kontrolforeningerne satte ydelseskontrollen i system. Formålet beskrives i de oprindelige vedtægter for Kontrolforeningen for Væjen og Omegn således:

*„Foreningens formål er at danne stammer af køer, der giver megen og fed mælk“.*

## Ydelseskontrollen som grundlag for Kvægdatabasen

Dette formål indeholder både en avlsmæssig og en produktionsmæssig del. Kvægbrugeren kan nu udvælge højtydende køer (mælkefedt) at avle videre på, men han må også lære, hvordan han skal fodre for at opnå høj ydelse.

Om kontrolassistentens arbejde hed det:

*„Bestyrelsen antager på foreningens vegne en assistent, der udtager og kontrollerer prøver af hver enkelt ko's mælk, til dette brug anskaffes et Gerbers apparat. Assistenten fører samtidig et nøjagtigt regnskab over de enkelte køers mælk, smørudbytte og det til disse anvendte foder, ligesom han ogsaa udarbejder en oversigt over samtlige besætningers og enkelte individers indbyrdes forhold, så at man kan udtage dem, der måtte have en sådan avlsværdi, at de må skjønnes at kunne virke forbedrende og forædlende på den almindelige avl“.*

I Midtlangelands udvidede Kontrolforening, som blev startet i 1907 af konsulent A. C. Duborg, førte man ikke alene regnskab over køernes ydelse og foderforbrug, men kontrolassistenten førte økonomisk regnskab for hele bedriften, såvel husdyrbrug som markbrug. Det var datidens kombination af periodefoderkontrol og bidragsregnskab.

Systematiske registreringer fra ydelseskontrollen blev allerede tidligt anvendt som grundlag for beregninger på tværs af besætninger. De første bredt anvendte fodernormer blev offentliggjort af den svenske professor Niels Hansson i 1902. De hvilede på en bear-

bejdelse af indsamlede oplysninger om mælkeydelse og foderforbrug fra ydelseskontrollen i Sverige. Oplysninger fra ydelseskontrollen i Danmark var udgangspunktet, da professor Lars Frederiksen planlagde de forsøg, der førte frem til nye danske fodernormer i 1931 (136. Beretning fra Forsøgslaboratoriet). Lars Frederiksens videnskabelige arbejde førte til en justering af Niels Hanssons system.

### Fodringsvejledning

Efter at Lars Frederiksens normer var blevet udsendt, beregnede kontrolassistenterne, hvordan de enkelte køer skulle fodres. Køernes ydelse blev omregnet til 4% målemælk, og køerne sat i foderklasse. Kvægbrugeren lavede selv sin foderplan eller valgte en standardfoderplan (ofte fra hæfter udgivet af Landhusholdnings-selskabet). I 50'erne begyndte de såkaldte fællesledelser at ansætte husdyrbrugskonsulenter, som bl.a. skulle hjælpe med udarbejdelse af foderplaner. I løbet af 60'erne ansatte de lokale landbøforeninger og husmandsforeninger egne fodringskonsulenter, som efterhånden overtog dette arbejde.

I 1972 blev der åbnet mulighed for, at man kunne indberette en grundfoderplan, hvorefter der ved hver kontrollering blev lavet en EDB-beregning af, hvor meget foder hver enkelt ko skulle tildeles. Resultaterne blev udskrevet på såkaldte „foderslipper“, som kunne hæftes på landmandens egne staldtavler. På den ene ende stod oplyst koens nummer, mælke-mængde og fedtprocent ved



seneste kontrollering og på den anden ende enten foderklasse eller tildeling af kraftfoder (fulde mængder) og grovfoder (kun ved nedsatte mængder). Lars Frederiksens normer blev anvendt helt frem til 1984, hvor de nye principper for fodertildeling (551. Beretning fra Statens Husdyrbrugsforsøg) blev sat i gang. I den mellem-liggende periode var køernes ydelse steget fra 133 til 253 kg fedt.

I 1976 blev et udvidet foderprogram sat i drift, det såkaldte KO-OP. Programmet kunne på baggrund af indberettede oplysninger om dyrene i besætningen beregne en prognose over indgang og afgang af dyr, mælkeproduktion og foderbehov 3 år frem i tiden.

Det krævede, at oplysninger om insemineringer, løbninger og drægtighedsundersøgelser var til rådighed. I modsat fald benyttede man gns. kælvningsinterval eller gns. kælvialder til at beregne forventede kælvninger. I starten manglede en del oplysninger fra kvægavlsforeningerne, eller de var stærkt forsinkede.

Nu overføres de nødvendige grunddata fra 1.500.000 insemineringer og 700.000 drægtighedsundersøgelser m.v. elektronisk fra inseminørens håndterminal, via kvægavlsforeningens PC til Kvæg-databasen.

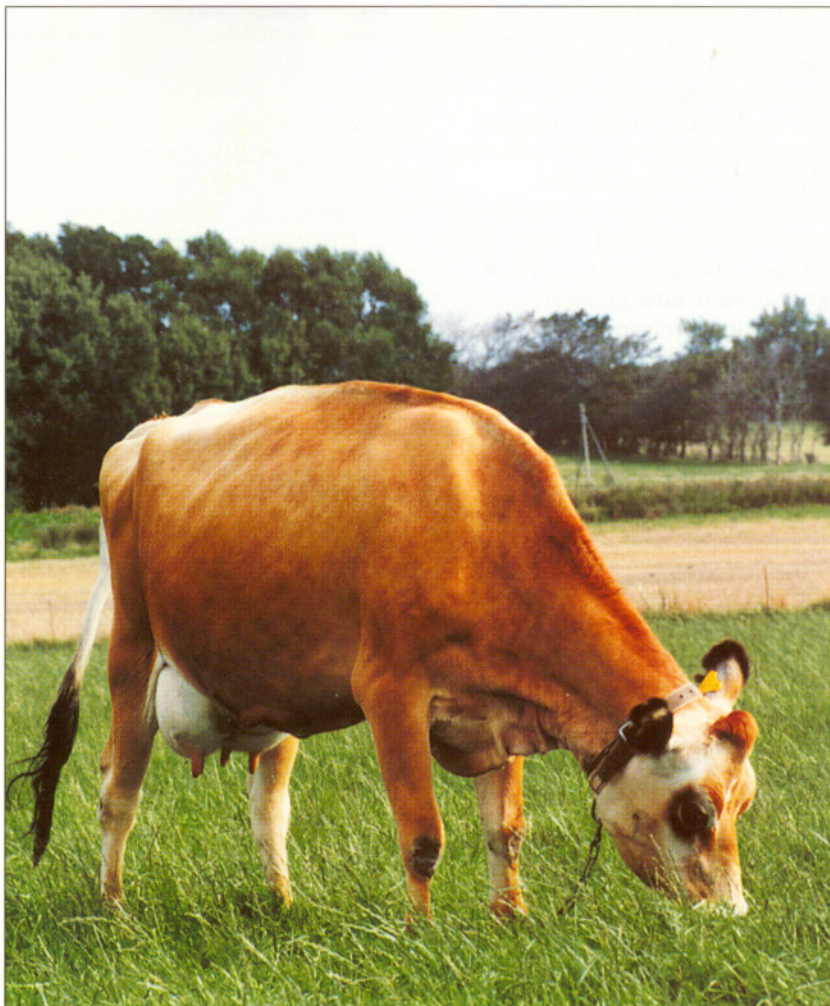
I 1984 indførte EU mælkekvotesystemet, som i Danmark administreres af Mælkeudvalget på vegne af Landbrugsministeriet. En fornuftig produktionsplanlægning omfattede nu også hensynet til mælkekvoten.

Efter forhandling med Mælkeudvalget lykkedes det at få også denne oplysning overført til Kvæg-databasen, så den både kunne anvendes i KO-OP og sættes på udskrifter fra ydelseskontrollen.

Fra 1984 blev et nyt system til

beregning af foder sat i gang, idet man indførte såkaldt strategifodring, hvor alle køer i besætningen i de første måneder efter kælvning tildeles samme kraftfodermængde og grovfoder efter ædelyst. Man forlod foderklasserne, fordi man havde fundet ud af,

*Jersey har været i Danmark i 99 år*





at foderudnyttelsen faldt med stigende fodertildeling, og fordi man ønskede at styre også efter køernes huld. Systemet udskriver foderet til den enkelte ko på lister eller tavler. Hvis landmanden ikke har indberettet foderplan, udskriver systemet, hvor mange foderenheder, koen skal have.

### **Mejerier**

Allerede i 1906-07 var mælkemængden fra mejeriet optrykt sammen med ydelseskontrollens tal i beretningerne for Fyn og Sjælland. Fra 1911 blev det obligatorisk. Fynboerne var først med obligatorisk optryk af fedtprocenten fra mejeriet, som blev indført i 1923. Meget hurtigt efter var det almindelig praksis i alle landets kontrolforeninger.

Efter indførelsen af EDB-regnskab for ydelseskontrollen og EDB-afregning af mælken til landmanden blev der etableret elek-

tronisk overførsel af data fra mejerierne til ydelseskontrollens kvægdatabase.

Afvisninger mellem kontrolforening og mejeri har gennem årene givet anledning til megen diskussion. Afvisninger i mælkemængde kan have mange årsager: stor tilbageholdelse af mælk til kalve, som følge af yversygdom eller kvoteproblemer, fejlbetjening af mælkemålere, afvigende kontrol-døgn, køer uden for kontrol m.m.

Afvisninger i fedtprocenten kan skyldes manglende omrøring i mælketank, forkert betjening af mælkemålere (ydelseskontrol og tankvogn), overslæb i tankbilers prøveudtagningsudstyr m.m.

Fra 1978 blev der overført data fra mejerierne hver måned, og der blev lagt faste grænser for afvisninger på mælkemængde og fedtprocent ind i systemet, således at der automatisk bliver peget på

mulige problembesætninger. Hvis afvisningerne er for store, skal den lokale kontrolforening tage stilling til, om kvægbrugeren har en tilfredsstillende forklaring. I modsat fald bliver regnskabet overført til uofficiel status.

Mejeriernes mælke kvalitetsrådgivere benytter data fra ydelseskontrollens celletalsanalyser i deres arbejde i problembesætninger, og ydelseskontrollen får information om udtagning af enkeltkirtelprøver, som skrives på celletalsopgørelsen.

### **Slagterier**

Med indførelsen af CKR-nummeret (se senere) blev det muligt at knytte data fra slagterierne til Kvægdatabasen. Overførsel af data startede i 80'erne, og databasen modtager nu årligt oplysninger om 700.000 slagtninger.

Det er oplysning om slagtetidspunkt, kategori (kalv, ungtyr, ung ko osv.), slagtevegt og klassificering. Vi udvikler p.t. mulighed for også at registrere andre bemærkninger fra slagtingen, sådan som det har været kendt fra slagting af svin gennem mange år.

Oplysningerne har i høj grad betydning ved kontrol af produktionsforløbet i besætningen. Er tilvæksten på slagtekalvene høj nok? Er udsætterkoerne fedet ordentligt færdige? Har vi problemer med leverikter eller leverbylder? Oplysningerne har også vist en så sikker sammenhæng til fædreneres resultater ved individprøven, at de også kan anvendes i avlsarbejdet.

*Foss Electric analyseudstyr.*





### **Sundhedsrådgivning**

Indsamling af data om sygdomsbehandling, klovbeskæring m.v. er kommet rigtigt i gang i løbet af det seneste tiår. Kvægdata-basen modtager oplysninger fra Dyrlægedata eller via staldregistreringsskemaer. I alt indkommer der p.t. oplysning om ca. 700.000 behandlinger årligt.

De indsamlede data anvendes i sundhedsrådgivningen hos den enkelte kvægbruger (styringslister og nøgletalsudskrift), men kan også indgå i beregning af indeks for sundhedsegenskaber (f. eks. mastitisresistens).

Databasen har vist sig værdifuld ved kontrol af arvelige misdannelser, og den er nu taget i brug også i forbindelse med smittomme sygdomme som f. eks. BVD, hvor kvægbrugeren kan få lister over de enkelte dyrs status på baggrund af blodprøvnings og afstamning.

### **Identifikation**

Identifikation af et dyr var først baseret på dets udseende. Systemet anvendes også i dag i de brogede kvægracer, selv i højtudviklede lande (tegning eller foto af dyret). Efterhånden kom systemer som brændemærkning af hud eller horn, randklip og tatovering. Metaløremærker blev også anvendt i begyndelsen af 1900-tallet. I Danmark var det især aluminiumsmærker med indstemplet løbenummer, fødselsår samt fars og mors nummer.

Omkring 1915 blev kvægavls- og kontrolforeninger enige om at benytte et fælles randklipsystem. Kalvene blev randklippet med mo-



*Ko med MAGTAG elektronisk identifikation*

derens nummer, og når en kvie havde kælvet, blev hendes nummer som kø brændt i hendes horn. Efterhånden som afhorning blev almindeligt anvendt, måtte man nøjes med det oprindelige øreklip (moderens nummer). I dag har dyrene eget nummer fra fødslen, som vi derfor klipper nu - bortset fra det er øreklipsystemet det samme, som blev vedtaget for 80 år siden.

Fælles for de hidtil nævnte systemer er, at de ikke kunne anvendes på tværs af besætninger. Randklip „15“ fortæller ikke, hvor dyret stammer fra. Den fuldstændige identitet af dyret skulle faktisk omfatte kontrolforeningsnummer, landmandens medlems-

nummer i kontrolforeningen og dyrets konummer.

For at opnå en entydig identifikation af kvæg indførte Landsudvalget for Kvæg i 1982 det Centrale Kvægbrugsregister, i daglig tale CKR-registeret.

Systemet indeholder 2 led, nemlig et ejendomsnummer og et dyrnummer. Ejendomsnummeret er på 5 cifre og knyttes til adressen på ejendommen. Hvis ejeren flytter, forbliver nummeret på ejendommen. Det er altså et entydigt nummer for den pågældende ejendom.

Ejendomsnummeret er uafhængigt af amt, kommune, kontrolforening etc. Dyrnummeret er på 4 cifre, hvilket giver mulighed for



9999 forskellige dyrnumre på ejendommen. I 1982 betød det, at en gennemsnitsbesætning kunne køre i næsten 200 år, før det ville blive nødvendigt at starte forfra igen. Det må dog forudses, at der allerede omkring år 2000 vil være besætninger, der rammer mod loftet.

I 1982 blev det indført, at samtlige dyr i ydelseskontrollen skulle bære et metaløremærke, hvori dyrets nummer var præget. Der opstod utilfredshed med metaløremærket, først og fremmest fordi det ikke kunne læses på afstand. I 1990 gik man så over til at anvende gule plasticøremærker, hvor dyrnummeret er præget med store typer (25 x 5 mm), så de kan læses på flere meters afstand.

I 1993 skulle Landbrugsministeriet indføre et entydigt system til mærkning og registrering af husdyr i Danmark. Efter forhandlinger med landbrugets organisationer blev der opnået enighed om, at Landbrugsministeriet overtog systemet som det officielle danske mærkesystem.

Landbrugsministeriets register hedder Det Centrale Husdyrbrugsregister, i daglige tale CHR-registeret. Det holdes løbende opdateret via erhvervenes besætningsregister, kaldet HBES. Her sker tildeling af ejendomsnumre, besætningsnumre og nummerering af øremærker til kvæg, får og geder.

CHR-registeret og HBES indeholder oplysninger om ejendomme og besætninger. CKR-registeret indeholder oplysninger om de enkelte kreaturer.

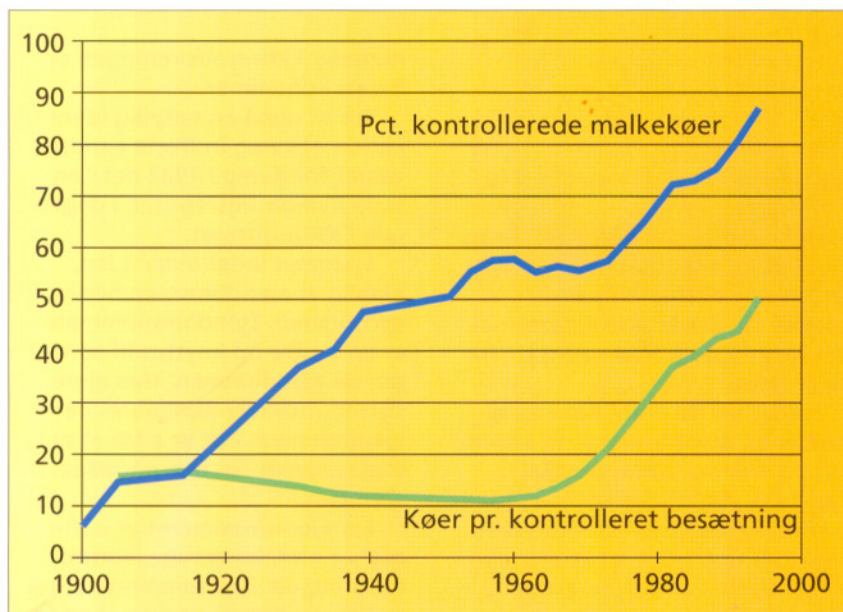
#### Her står vi

Hovedparten af de oplysninger, kvægbrugeren i dag naturligt anvender om sine dyr, ville ikke være til rådighed uden ydelseskontrol og kødkvægregistrering. Det gælder både oplysninger til den daglige styring i besætningen og oplysninger til racernes avlsarbejde.

85% af de danske malkekøer deltager i ydelseskontrollen. Databasen indeholder oplysninger om ca. 2.000.000 levende kreaturer og om i alt ca. 15.000.000 kreaturer. Hvert år indgår 6.600.000 prøvemalkninger, 700.000 kælvninger, 600.000 køb og salg, resultater fra 6.000.000 mælkeanalyser, 1.500.000 insemineringer, 700.000 drægtighedsundersøgelser o. lign. og om 700.000 registrerede sygdomstilfælde. Hertil kommer oplysninger om eksteriorbedømmelse, skylninger, ægtransplantationer, klovbeskæring o.m.a.

Resultater fra officiel ydelseskontrol kan i forbindelse med EU's præmieordninger for oksekød anvendes som dokumentation for, at besætningens ydelse ligger over 6150 kg mælk. Både de veterinære myndigheder og EF-direktoratet anerkender notatføring under ydelseskontrol eller kødkvægregistrering som tilstrækkelig dokumentation - naturligvis under forudsætning af, at oplysningerne er fuldstændige og korrekt førte.

Figur 7. Andel kontrollerede køer og besætningsstørrelsen er stigende





Ydelseskollen var baggrund for udvikling af Kvægdata-basen, og den står således som grundpille for avlsværdiurdering og produktionsstyring inden for malkekvæg. Herudover fremstår den også som et værdifuldt materiale i forbindelse med forskning og undersøgelser af generelle forhold.

#### **Fremtiden**

En udfordring for fremtiden vil blive at fastholde og udbygge den andel af kjerne, som deltager. Vi har indtil nu ikke haft oplysninger om stalddtype og lignende på Kvægdata-basen, men disse oplysninger vil vi gerne have med for at kunne belyse sammenhænge mellem stalddtype, produktion og sundhed. Det kan måske også danne baggrund for certificering af visse produkter.

På kongressen i den internationale organisation af kontrolforeninger (ICAR) i 1994 fremlagde Danmark en rapport, der med resultater fra såvel sammenligningen til mejerital som fra den obligatoriske efterkontrol viste, at B-kontrollen i Danmark er lige så sikker som A-kontrollen.

Rapporten bygger ikke alene på resultater fra Danmark, men data fra de øvrige nordiske lande og fra Holland er anvendt til sammenligning. Vi er kommet langt med hensyn til at billiggøre ydelseskollen, men må fortsat være vågne for nye muligheder.

Det bliver en udfordring at udnytte og tilpasse sig den tekniske udvikling på mælke-målere, analyseudstyr og elektroniske styresystemer i stalddene.

Ydelseskollen skal udvikles til at kunne modtage og behandle resultater direkte fra elektroniske mælke-målere, der måske er koblet på malkerobotter, og kunne udveksle data med elektronisk styrede malkeanlæg og foderudstyr. Ny teknik vil kunne måle mælkes temperature og ledningsevne, og måske skal vi også kunne opsamle data fra skridttællere eller andet elektronisk måleudstyr, som koe er udstyret med.

For at udnytte mulighederne fuldt ud bliver elektronisk identifikation en nødvendighed. Her har Landsudvalget for Kvæg deltaget i udviklingen af systemet MAGTAG, som kan placeres i øremærker til kvæg, og som kan programmeres sådan, at det nuværende identifikationssystem vil kunne fortsætte uændret i elektronisk form.

Danmark, Norge, Sverige og Finland arbejder på at opbygge grundlaget for et fælles database-system, hvorved forstås at inddata er defineret ens og lagres ens. Det vil kunne føre frem til, at man kan nøjes med at udvikle ét database-program og én datamodel, som så kan anvendes i 4 kopier i hvert sit land, eller de 4 lande kan køre på en fælles database.

Databasen kunne være fælles for malkekvæg og kødkvæg, for alle grundoplysninger om identifikation, reproduktion og sundhed kan registreres på samme måde uanset racens formål. Det er kun produktionsmålene, hvor der er indlysende behov for at gøre forskel på malkekvæg og kødkvæg.

Naturligvis skal uddata være tilpasset de enkelte lande og racer. Samme races avlsmål er ikke nødvendigvis ens i forskellige lande, og landene har hver sit sprog.

Andre lande har allerede vist interesse for dette arbejde, som dels har til formål at minimere udviklingsomkostningerne pr. ko, men som også vil kunne ændre muligheden for dataoverførsel mellem baser dramatisk.

Ydelseskollen blev startet for 100 år siden, men dens betydning har været stadigt stigende i takt med mulighederne for udnyttelse af datamaterialet.

Ydelseskollen skal være præcis og pålidelig, men den skal samtidigt fungere så enkelt og billigt for kvægbrugeren som muligt. Dansk ydelseskontrol har altid været med fremme på internationalt niveau. Det vil vi også være i fremtiden. ■





Af afdelingsleder Thorkild Lykke,  
Landskontoret for Kvæg

# Stambogsføring og avlsværdivurdering

Ydelseskontrollen har i det meste af dette århundrede været fundamentet for stambogsføring og avlsværdivurdering. Disse to aktiviteter virker meget forskellige, men er alligevel to sider af samme sag.

Stambogsføringen har haft som formål at fastholde og offentliggøre oplysninger om afstamningen for køer og tyre, så disse oplysninger har kunnet danne grundlag for avlsarbejdets planlægning og gennemførelse.

Avlsværdivurderingen bygger på afstammingsmæssige informationer og har som formål at frembringe konkrete informationer om de enkelte dyrs avlsværdi. Avlsværditalle og afstammingsinformationerne indgår i dag som et fælles grundlag for avlsarbejdet.

## Historisk set

### Stambogsføring

Stambogsføringen blev indledt i 1881, ca. 15 år før ydelseskontrollens etablering. De første optegnelser blev således foretaget alene med baggrund i afstammingsmæssige informationer og ud fra en subjektiv vurdering af dyrenes kvalitet. Senere blev stambogsføringen baseret på ydelseskontrollens afstammings- og ydelsesin-

formationer, og det gjorde den langt mere værdifuld. Stambogsføringen indeholdt nu en objektiv vurdering af dyrenes kvalitet.

Optagelse i stambogen var gennem mange år et kvalitetsstempel for tyre og køer og gav dem dermed en anerkendelse som avlsdyr. Optegnelse af køer var også en æressag for de enkelte besætningsjere, og der var en opdeling af besætningerne i avls- og brugsbesætninger.

Fra 50'erne og 60'erne blev kvalitetsvurderingen i stigende grad foretaget ud fra avlsværditalle, og stambogen fik dermed en ændret status og blev mere et kartotek end en kvalitetsparameter.

### Avlsværdivurdering

Avlsværdivurderingen var før ydelseskontrollens etablering baseret på en vurdering af dyrenes udseende og såkaldte malketegn, men efter indførelsen af ydelseskontrollen var der skabt basis for en egentlig avlsværdivurdering ud fra konkrete målinger.

### Afkomsundersøgelser

Den første avlsværdivurdering blev foretaget for tyre, idet der i starten af 1900-tallet var etableret et stort antal tyreholdsforeninger i Danmark. Foreningernes tyre blev brugt til mange køer, og der var behov for en kvalitetsvurdering.

De første forsøg herpå blev gjort med afkomsundersøgelsen, som indeholdt en sammenligning af døtres og mødres ydelse. Fremgangen for en tyrs døtre i forhold til deres mødre blev betragtet

som et udtryk for tyrens avlsværdi, men metoden viste sig hurtigt utilstrækkelig på grund af ændringer i fodrings- og miljøforholdene.

Efter indførelsen af den kunstige sædooverføring i 1936 opstod der interesse for en hurtig og effektiv metode til fastlæggelse af den enkelte tyrs avlsværdi, og i 1945 oprettedes afkomsprøverne for mælkeproduktion.

Statens Husdyrbrugsforsøg forestod arbejdet med tilskud fra Landbrugsministeriet. Et afkomsprøvehold (20 kvier) blev samlet på én station og afprøvningen varede i gennemsnit 304 dage.

Foderplanen var den samme på alle stationer. De vigtigste resultater var ydelsen, men der kom også information om eksteriør, foderforbrug, tilvækst og en række brugs mæssige egenskaber. Afkomsprøvernes udbredelse kulminerede i 1957-58, hvor der var 102 hold. Gennemsnitsydelsen steg fra 177 kg smørfedt i 1945-46 til 262 kg i 1973-74.

Afkomsprøverne havde en svaghed ved, at det var vanskeligt at gøre forholdene ens fra station til station, og dette var sammen med store omkostninger årsag til stationernes nedlæggelse i 1974.

### P- og R-tal

En billigere avlsværdivurdering blev indledt i 1962, hvor Landbrugsministeriets Produktivitetsudvalg, Husdyrbrugsudvalget, begyndte at offentliggøre resultater af en systematisk undersøgelse af ydelsen hos døtregrupper efter tyre ved hjælp af materiale fra de kontrolforeninger, der bearbejdede



de regnskaberne med edb. I de første år blev resultaterne fra disse undersøgelser publiceret som dötregruppernes gennemsnitlige mælke- og smørfedtydelse i 130 og 305 dage af første laktation.

I 1964/65 blev der indført en korrektion af døtrenes ydelse dels for alder, dels for ydelsesniveauet i tilhørsbesætningerne. For at lette vurderingen blev der desuden indført to nye begreber, P-tallet og R-tallet. P-tallet var et procenttal, der viste afkomsgruppens korrigerede smørfedtydelse i de første 130 dage af 1. laktation i procent af den pågældende races gennemsnitlige smørfedtydelse.

R-tallet viste afkomsgruppens smørfedtydelse i 305 dage i procent af racens gennemsnitsydelse for alle 1. kalvs køer ved samme alder og samme besætningsniveau. R-tallet fik således en gennemsnitsværdi på ca. 100 for alle racer.

I 1971/72 indførtes hos tyre en korrektion for kælvningsmåned, således at ydelsen hos dötregupper, som kælvende på forskellige årstider, kunne sammenlignes på korrekt måde.

På dette tidspunkt udviklede Statens Husdyrbrugsforsøg også et Y-tal, der for køer angav den forventede avlsværdi for smørfedtydelse i 1. laktation. Y-tallet blev taget i anvendelse i ydelseskontrollen i 1975. Y-tallet blev beregnet på grundlag af koens egen smørfedtydelse i 1., 2. og 3. laktation samt faderens og moderens avlsværdi for smørfedtydelse.

I 1980 omdannedes R-tallet til et avlsværdital, og der blev udviklet en metode til indregning af den forventede ydelse hos døtre med ufuldstændige laktationer. Dermed kunne R-tallet beregnes på et tidligere tidspunkt, og det

overflødiggjorde P-tallet, som blev afskaffet.

#### **Protein i avlsarbejdet**

I 1985 indførtes i ydelseskontrollen en systematisk registrering af mælkens proteinindhold, og dermed var der skabt basis for at inddrage mælkeproteinet i avlsarbejdet. Det skete i 1986, hvor et nyt avlsværdivurderingssystem „Direkte opdatering“ blev taget i anvendelse.

Baggrunden for at inddrage proteinet i avlsarbejdet var et ønske om at ændre protein/fedt forholdet i mælken. Undersøgelser havde vist, at selv om fedt- og proteinproduktionen genetisk er stærkt forbundet, ville en ensidig satsning på protein i stedet for fedt give mulighed for hos hver ko pr. år at ombytte et halvt kg smørfedt med et halvt kg protein.

*DRK - vor mindst udbredte race, men et godt eksempel på at import af gener kan være lønsom*





## Nutiden

### Direkte opdatering

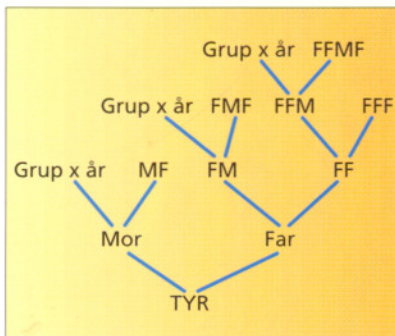
I 1986 blev avlsværdiurderings-systemet „Direkte opdatering“ taget i anvendelse, og der indførtes nye avlsværdital M, F og P for ydelsen af henholdsvis mælk, fedt og protein. Dermed blev det muligt i avlsarbejdet at tillægge disse egenskaber forskellig vægt, og de enkelte racer fastlagde med udgangspunkt i deres avlsmål, hvorledes de ønskede at vægte egenskaberne.

Disse beslutninger blev inddraget ved udformning af et samlet ydelsesindeks Y-indekset, der beregnes således:

Y-indeks =  $V_M \times (M\text{-indeks} \div 100) + V_F \times (F\text{-indeks} \div 100) + V_P \times (P\text{-indeks} \div 100) + 100$ ,  
hvor  $V_M$ ,  $V_F$  og  $V_P$  er vægtfaktorer.

I tabel 4 ses de nugældende vægtfaktorer.

Figur 8. Illustration af opbygningen af slægtskabet mellem tyrene



Tabel 4.

### Avlsmål for ydelse hos de danske malkekvægracer udtrykt i form af vægtfaktorer ved beregning af Y-indekset

	Vægtfaktor for		
	M-indeks( $V_M$ )	F-indeks( $V_F$ )	P-indeks( $V_P$ )
RDM	-0,100	0,000	1,100
SDM	-0,125	0,375	0,750
Jersey	-0,111	0,222	0,889
DRK	-0,125	0,375	0,750
Øvrige	-0,125	0,375	0,750

### BLUP

Fra 1993 ændredes avlsværditalsberegningen for tyre, så der i stedet for "Direkte opdatering" bliver anvendt en BLUP-model.

Som informationer inddrages ydelsen i 1. laktation samt ydelsen hos eventuelle sønnetøtre.

Desuden inddrages slægtskabsinformationer som vist i figur 8.

Der inddrages informationer om tyrenes fædre og mødre samt tidligere led i deres afstamning. Døtrenes ydelse i 1. laktation korrigeres for følgende:

- Besætning x år
- Kælvningsmåned x år x område
- Alder ved kælvning
- Døtrenes mødres avlsværdi

Metoden giver sikre resultater og er i overensstemmelse med de metoder, der anvendes i andre lande. Beregningsystemet giver et godt beslutningsgrundlag for kvægbrugere og kvægavlens ledelse.

### S-indeks

I 1983 drøftede kvægavlens ledelse, hvorledes man bedst skulle udnytte de mange informationer, der bl.a. fra ydelseskontrollen fremkommer om andre egenskaber end ydelse.

Resultatet blev, at det efter forslag fra Statens Husdyrbrugsforsøg og Landskontoret for Kvæg blev besluttet at indføre et samlet indeks - S-indekset - til brug ved udvælgelse af avlsdyr. S-indekset beregnes ud fra egenskaberne ydelse, kødproduktion, reproduktion

### Avlsværdital for tyre





Tabel 5.

## Vægtfaktorer til beregning af S-indekset

Egenskab	RDM	SDM	JER	DRK
Y-indeks	0,65	0,70	0,75	0,50
I-indeks	0,30	0,23	0,09	0,35
Døtrefrugtbarhed	0,30	0,32	0,29	0,25
Kælvningsindeks	0,17	0,18	0,05	0,14
Mastitisresistens	0,22	0,42	0,24	0,20
Krop		0,21		0,19
Lemmer	0,14	0,36	0,10	0,34
Malkeorganer	0,41	0,35	0,36	0,51
Malketid	0,21	0,14	0,24	0,15
Temperament	0,06	0,04	0,08	0,03

tion, mastitisresistens, eksteriør og brugsegenskaber. De relative avlsværdital for disse egenskaber tildeles en vægt, der er bestemt af deres forventede økonomiske og biologiske betydning på længere sigt.

S-indekset er et tal, som under de givne forudsætninger er det bedst mulige skøn over en tyrs totale sande avlsværdi for de egenskaber, der ønskes forbedret hos den pågældende race. I tabel 5 er vist de egenskaber, der i dag inddrages i beregning af S-indekset, og for hver race er anført de vægtfaktorer, der anvendes i 1995.

### Stambogsføring

Stambogsføringen er i de seneste år ændret radikalt, idet edb-anvendelsen har skabt en ny situation. Midt i 80'erne blev al stambogsføring indlagt i edb-systemerne, hvorved oplysningerne var langt mere anvendelige såvel på Landskontoret for Kvæg som på de lokale kontorer.

Fra sidst i 80'erne ophørte udsendelsen af trykte stambøger. Det betyder ikke, at oplysningerne er forsvundet, blot at de nu kan

### Stambøger



trækkes på edb-skærmen. Det er langt billigere og mere effektivt, og så er oplysningerne, der anvendes, altid ajourførte. I 1991 udsendte Landbrugsministeriet med baggrund i et EU-direktiv en ny bekendtgørelse om racerent avlsvæg. Bekendtgørelsen fastlægger, at stambogen udgøres af alle registrerede renrace dyr, og der kan ikke stilles kvalitetskrav i forbindelse med optagelse i stambogen.

Stambogsreglerne kan ikke mere bruges til en stærk styring af en races udvikling, men fastlægger alene hvilke dyr, der kan betragtes som racerene. De nye regler betyder, at den danske stambog er opbygget som i de fleste andre lande og indeholder de renrace dyr i ydelseskontrollen.



## Fremtiden

Avlsværdiurderingssystemet er under stadig ændring og forbedring, idet der gennem forskning og undersøgelser løbende fremkommer ny viden.

For ydelse planlægges der i 1997 en overgang til anvendelse af den mest avancerede BLUP-model - der benævnes Animal Model eller enkeltdyrmodellen. Dermed vil beregningsmetoden for såvel køer som tyre blive ændret.

Den nye model adskiller sig fra de hidtil anvendte ved at inddrage informationer om alle kendte slægtninge. Metoden vil give små forbedringer i tyrenes avlsværdier, men effekten vil især fremkomme i form af mere sikre avlsværdital for køer. Dermed kan tyremødrene udvælges med større sikkerhed.

Avlsværditalle for andre egenskaber end ydelse bliver ligeledes løbende forbedret med baggrund i en bedre registrering og resultater fra forskningen. Der arbejdes p.t. meget for at forbedre de avlsmæssige oplysninger om frugtbarheds- og sygdomssegenskaber.

Først i 90'erne blev hele eksteriørvurderingen og avlsværditalle for eksteriøregenskaber omlagt, så sikkerheden på informationerne blev bedre, og de blev i overensstemmelse med international standard.

## International sammenligning

De seneste år har der været en stigende udveksling af avlsmateriale over landegrænserne. Derfor øges kravene til mulighederne for omregning af avlsværdital mellem lande, så udvælgelsen af avlstdyr kan foretages med baggrund i sammenlignelige avlsværdital.

Organisationen Interbull er oprettet med henblik på at skabe et fællesskab mellem lande om beregning af internationalt sammenlignelige tal. Mange lande har allerede tilsluttet sig organisationen, der har kontor ved landbrugsuniversitetet i Uppsala i Sverige.

Omregning af avlsværdital er kun mulig, hvis man har gode forbindelseslinier i afstamningen og dermed kendskab til det genetiske niveau i de involverede lande. Interbull stiller betydelige krav til kvaliteten af avlsværdiurderingen i de enkelte lande for at man kan få lov til at deltage. Baggrunden er, at omregningen bliver forkert, hvis den nationale avlsværdiurdering ikke fungerer perfekt.

Interbull har i februar 1995 offentliggjort resultater for en international rangering af tyre i de involverede lande, og resultaterne er iagttaget med stor interesse.

I første omgang har Interbull's arbejde alene vedrørt ydelse, men målet er, at omregningen på længere sigt også skal omfatte alle øvrige egenskaber.

Interbull's udnyttelse af data fra ydelseskontrollen understreger værdien af, at vi i Danmark har en meget sikker registrering af grunddata, der danner fundamentet for avlsværdiurderingen.

## Afslutning

I de kommende års avlsarbejde forventes den avlsmæssige fremgang at blive forøget. Det skyldes dels bedre metoder til beregning af avlsværdital, dels en bedre udnyttelse af udveksling af avlsmateriale på tværs af landegrænser. Også en mere intensiv anvendelse af ægtransplantation, kloning, kønsbestemmelse m.v. vil fremme den avlsmæssige udvikling.

Forudsætningen for at nå den ønskede avlsmæssige fremgang er, at avlsværditalle har høj sikkerhed. Det nås kun, hvis registreringsarbejdet og beregningsarbejdet til stadighed ofres stor opmærksomhed, og hvis avlstdyrene ikke udsættes for systematisk særbehandling som f.eks. ved tildeeling af væksthormonet BST.

Ydelseskontrol og avlsværdiurdering vil også være i centrum af fremtidens kvægavl. ■





*Ko nr. 350 fra Else og Sigurd Andersen, Fyn.  
Danmarks smukkeste ko både 1990 og 1991 - på tværs af alle racer. I 1992 blev hun nr 2 i denne konkurrence i Herning. Den rekord bliver svær at slå!*





Af afdelingsleder Søren Borchersen,  
Landskontoret for Kvæg

Insemineringsarbejdet har siden dets start i 30'erne brugt ydelseskontrollens konummer-system. I forbindelse med, at det landsdækkende arbejde med ydelseskontrollen overgik til Landsudvalget for Kvæg i 1972, forbedredes mulighederne for koordinering af de mange arbejdsopgaver. Specielt har det fået stor betydning for anvendelsen og udnyttelsen af edb-teknikken inden for både avl og produktionsstyring.

De første skridt til anvendelse af edb-registrering blev gjort i 1965, da Horsensegnens Kvægavlsforening fik ført statistikker og udskrevet kontingentopkrævning via edb. Først i begyndelsen af 70'erne tages de første skridt til at gøre insemineringsarbejdet til en integreret del af ydelseskontrollen.

Strukturudviklingen inden for insemineringsarbejdet og ydelseskontrollen er over de sidste 20 år gået stærkt. Antallet af 1. insemineringer følger udviklingen i antal ydelseskontrollerede køer. Besætninger med inseminering er faldet kraftigt i de sidste 20 år, dels som følge af stigende besætningsstørrelse i malkekvægholdet og dels på grund af færre kødkvægbesætninger.

Den ændrede struktur har stor betydning for insemineringsarbejdet. Ca. 80% af de fødte kalve i ydelseskontrollerede besætninger er et resultat af inseminering.

## Ydelseskontrollen og insemineringsarbejdet

Tabel 6.

### Udviklingen i insemineringsantallet og kontrollerede køer

	1974	1984	1994
Antal 1. insemineringer	1.295.986	1.100.881	827.138
Antal besætninger med insemineringer	80.271	41.701	21.490
Antal foreninger	32	24	12
Antal besætninger med ydelseskontrol	28.348	18.386	11.739
Antal kontrollere køer	652.808	701.102	589.196
Antal kontrollerede køer pr. besætning	23,0	38,1	50,2

Kvægavlsforeningerne fik i 1975 et nyt EDB-program, som indeholdt forbedrede muligheder for udskrift af statistikker end tidligere, og derudover blev det muligt at opdatere sædproduktion og sædkvalitet for de enkelte tyre.

I 1979 blev der udarbejdet spørgeskort, der kunne udskrives fra LEC, og udskrives til de enkelte besætningsejere til besvarelse af kælvningsoplysninger, således at der kunne laves opgørelser over: kælvningsforløbet, kalvens livskraft og kalvens størrelse. Disse oplysninger blev brugt ved beregning af fødselsindeks for de enkelte tyre med henblik på at finde tyre velegnet til kvieinsemineringer.

I første halvdel af 80'erne starter kvægavlsforeningerne med at foretage indberetning af insemineringer i samarbejde med ydelseskontrollen på TP-stationerne. Samtidig hermed indføres CKR-registeret og -mærkningen.

I 1985 anvendte alle kvægavlsforeninger den fælles EDB-løs-

ning, hvorfra oplysningerne kunne overføres til ydelseskontrollens database. På TP-stationerne blev insemineringsoplysningerne m.m. tastet løbende, således at disse oplysninger kunne overføres og være til rådighed i ydelseskontrollen, og herefter kunne udskrives for det enkelte dyr på staldtavler og de forskellige udskrifter.

Kvægavlsforeningernes samarbejde med ydelseskontrollen omkring brug af registreringer blev i 1986 udvidet til at omfatte kælvningsoplysninger. Kvægavlsforeningernes spørgeskort vedrørende kælvningsoplysninger blev erstattet af muligheden for på staldregistreringsbilaget at indberette oplysninger om kælvningsforløb m.m. til beregning af fødselsindeks på den enkelte tyr.

Fra sommeren 1991 bliver indberetninger om insemineringsoplysninger en fuldt integreret del af ydelseskontrollen via den fælles kvægdatabase. Alle registreringer fra insemineringsarbejdet indberettes direkte til kvægdata-

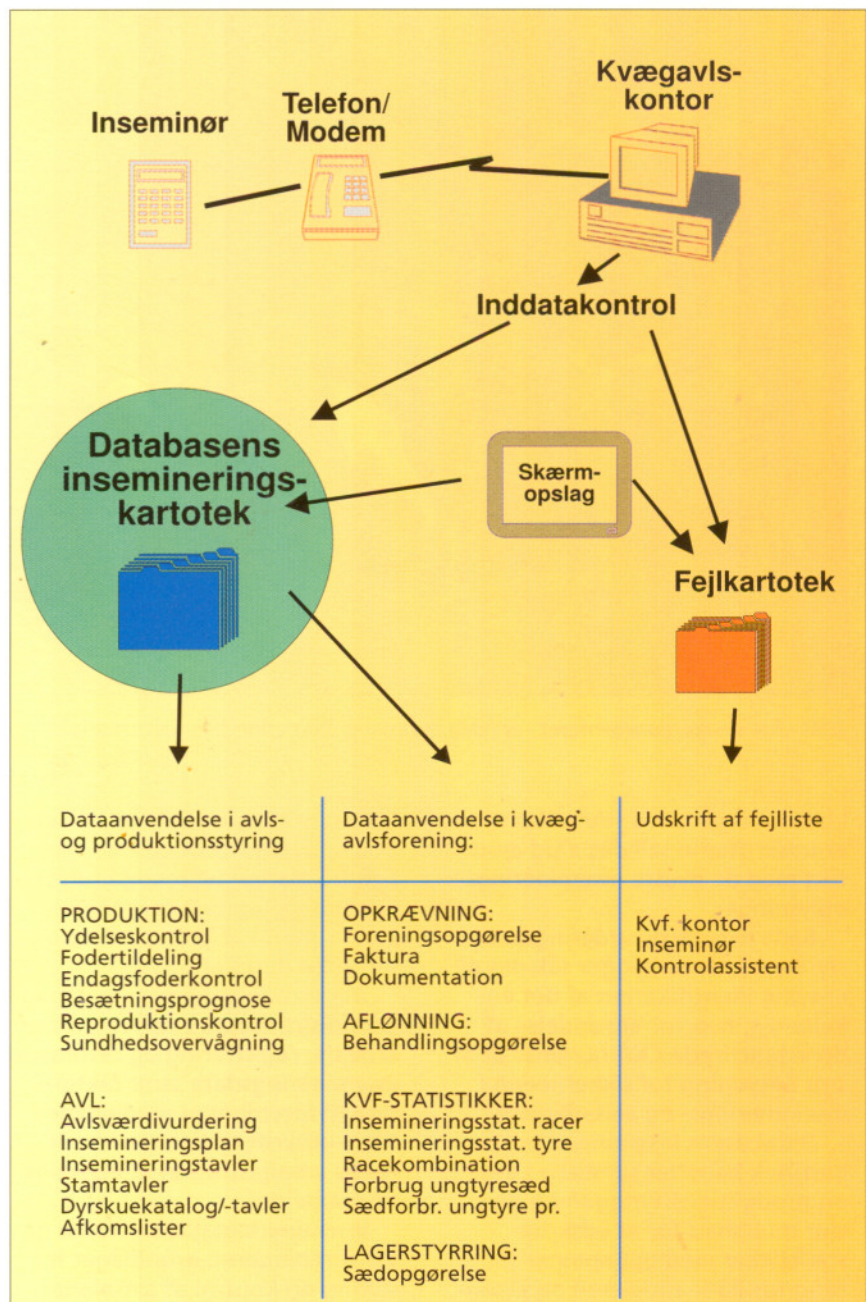


basens insemineringsdel, hvorfra oplysninger kan udskrives til brug i kvægavlsforeningerne og i produktionsstyringen. Dette har bl.a. betydet, at landmandens EDB-udskrifter for de enkelte dyr hurtigere bliver ajourført med inseminerings- og reproduktionsoplysninger.

Den nye EDB-løsninger har endvidere givet følgende fordele:

- Hurtigere og mere sikker fejlretningsprocedure.
- Insemineringer og behandlinger kommer hurtigere ud på udskrifter.
- Flere nye udskrifter til både kvægavlsforeninger, inseminører og medlemmer
- Udskriftsgrundlag for aflønning af inseminører og opkrævning hos kvægavlsforeningens medlemmer.
- Mulig lagerstyring på tyrestationernes laboratorier og ud i inseminørens sædspand.
- Oplysninger registreret i insemineringsarbejdet kan effektivt udnyttes i produktionsstyringen.

I dag indberettes alle insemineringsoplysninger ved hjælp af elektronisk dataoverførsel fra inseminørens håndterminal via telefon-modem til kvægavlskontoret, og overføres herfra til databasens insemineringskartotek på LEC (Landbrugets EDB-Center). Dette betyder, at oplysninger om insemineringer og behandlinger bliver ajourført af inseminøren senest efter 2 dage.



Figur 9. Oversigt over indberetning og anvendelse af insemineringsdata





SDM - her smukt repræsenteret - er i dag Danmarks mest udbredte malkerace

I besætninger med ydelseskontrol er udskrifterne således altid ajourført med de nyeste insemineringsoplysninger.

Både avlsværdiurderingen og styresystemerne bygger således på entydig identifikation af det enkelte dyr, hvorfor anvendelse af dyrets nicifrede CKR-nummer er af stor betydning for sikkerheden i inseminerings- og avlsarbejdet.

Databasens insemineringskartotek benyttes samtidig i avls- og produktionsstyringen og giver stor mulighed for at udskrive statistikker med oplysninger til brug for både rådgivere og kvægbrugere.

Med udvikling af det nye fælles EDB-system for kvæg er der løbende udarbejdet mange forskellige udskrifter, som foreningerne kan bruge til at vedligeholde og forbedre deres arbejde.

Der er udskrifter til den daglige administration af inseminørernes arbejde, registrering og rettelse af insemineringsdata samt fakturering til foreningens medlemmer. Disse udskrifter skal sikre en effektiv administration af insemineringsarbejdet.

Insemineringsstatistikkerne giver foreningerne grundlaget for styring og kontrol af avlsplanernes gennemførelse. Ud fra insemineringsstatistikken kan man ek-

sempelvis følge udviklingen med hensyn til antallet af insemineringer med de forskellige racer og tyre. For at få en hurtig og ensartet afprøvning af ungtyrene kan der udskrives information om medlemmernes forbrug af ungtyre, inseminørernes anvendelse af ungtyre og sædforbruget af ungtyrene.

Med udskrifter fra sædlagerstyringssystemet er det muligt at følge udviklingen i sædproduktion samt salg og indkøb af sæd. I EDB-system kan kvægavlforeningen registrere foreningens samlede sædbeholdning. Det giver et samlet overblik, som kan medvirke til at reducere sædspild og omkostninger til produktion og indkøb af sæd.

Inseminørstatistikken er et hjælpemiddel til foreningens strategiske planlægning. Det er ud fra inseminørstatistikken, at foreningen kan følge udviklingen i kvaliteten af insemineringsarbejdet. Desuden kan man følge udviklingen i brugen af drægtighedsundersøgelser og andre behandlinger.

Ved registrering af insemineringer foretaget i ydelseskontrollerede besætninger beregnes:

- Antal 1. insemineringer.
- Det gennemsnitlige antal dage fra kælvning til 1. inseminering.
- Det gennemsnitlige antal dage fra inseminering til drægtighedsundersøgelse.
- 0-56 dages ikke-omløber procent.
- Antal insemineringer pr. hundyr.



Fra den fælles database er det endvidere muligt at udskrive en reproduktionsopgørelse, der angiver besætningens reproduktionsstatus. Til hjælp for styring og kontrol af reproduktionen i besætningen kan styringslisterne „Ikke påbegyndte dyr/påbegyndte dyr“ anvendes til udpegning af dyr, der bør brunstobserveres, drægtighedsundersøges eller geninsemineres.

Kvægbrugeren og rådgiveren har således flere muligheder for at trække på databasens mange informationer til brug i den daglige og strategiske styring af besætningens produktion.

Som eksempel på en styringsliste er i figuren vist en EDB-insemineringsplan. Insemineringsplanen

kan eksempelvis udskrives ved hver ydelseskontrol og giver kvægbrugeren tyreforslag til hver enkelt ko og kvie. Insemineringsplanen sikrer at indavl undgås, at der fås en rigtig ungtyreanvendelse, og at de bedste brugstyre anvendes hurtigst muligt. Insemineringsplanen kan hjælpe kvægbrugeren til at få den størst mulige andel i den avlsmæssige fremgang.

Det er i dag muligt at anvende registreringer i insemineringsarbejdet til brug i både produktions- og avlsarbejdet på populationsbasis og i den enkelte besætning.

Udviklingen i kravene til de foretagne registreringer vil fortsætte mod stadig mere sofistike-

rede løsninger, der muliggør en nøjagtig beskrivelse af alle handlinger, fra sæden produceres på tyrestationen, til den har resulteret i en drægtighed, og indtil det forventede afkoms produktionsresultat foreligger. Kvalitet i insemineringsarbejdet og de foretagne registreringer vil blive en forudsætning for fremtidens kvægavlsarbejde og insemineringsarbejde. Dette arbejde vil i fremtiden blive styrket ved forskning i sædproduktion og bioteknologi kombineret med brug af informationsdatabaser nationalt og internationalt. ■

Figur 10. Insemineringsplan for besætning med RDM og SDM køer.

Landsudvalget for Kvæg		Egen udskrift		Ins.plan, køer og kvier			
		CKR-nr.:		Udskrevet: 14.11.94		Side:	
CKR-dyrnr	Født	Sidste ins Nr	Ins tyr	-----Tyreforlag-----			
0611	6.12.85	4	23.09.94	RGK Lotus	CEN Erri	HJ Vogd	
0672	14.10.86	1	11.10.94	ØJY Mabru	RGK Nyt	Pigeonwood	
0714	31.05.87	2	30.09.94	HJ Vogd	RGK Lotus	HV Badut	
0750	14.11.87	3	13.07.94	RGK Lotus	CEN Erri	VAR Platin	
0811	30.09.88	3	6.04.94	RGK Lotus	CEN Erri	FYN Golf	
0816	2.11.88	1	30.05.94	US Arizona	RGK Lotus		
0817	12.11.88	4	11.09.94	ØJY Mabru	ØJY		
0828	11.12.88	1	22.08.94	ØJY Mabru			
0849	27.02.89	1	27.07.94				
0850	28.02.89	1					
0855	20.04.89						
0864							







# Preface

When a little more than 100 years ago, Dr. Gerber invented his simple, reliable, and - most importantly - portable milk fat determination equipment, this heralded a development of explosive dimensions.

The decision to set up the "Vejen & Omegns" Milk Recording Society soon turned out to be of epoch-making significance not only to Denmark's milk producers, but it also served as a model to others far beyond the national borders of our country.

Both the date when the first general meeting was held, viz. the 24 January 1895, and the date when the first milk recordings were carried out, which was the 29 April, are equally suitable dates when it comes to celebrating the 100 Year Jubilee of the Danish milk recording societies. We chose to have the Jubilee celebrations on the 29 April in order to avoid the risk of unfavourable meteorological phenomena disturbing the event.

To this Jubilee publication, a number of writers have contributed both short historical surveys, and articles of current interest, which all clearly demonstrate the central role plaid by the milk recording system in modern cattle breeding and production and in the cattle breeders' management of their farms in the present day and year of 1995.

The Danish National Department for Cattle Husbandry thus finds it quite appropriate to commemorate the centenary of the introduction of milk recording into cattle farming.

It is our hope that our readers in this country and abroad will take inspiration i.a. from this Jubilee publication to continue to improve the milk recording system and its related functions to the benefit of the milk producers, wherever they may be.

April 1995

Henrik Nygaard  
Chief Adviser  
The Danish National Department  
for Cattle Husbandry



# 100 Years of Milk Recording

By senior adviser Arne Nielsen,  
the Danish National Department for  
Cattle Husbandry

The initiative, which 13 farmers from the Vejen area took in 1895 in establishing the world's first milk recording society, soon turned out to be the first tender seeds of an agricultural activity of inestimable importance to cattle farming in all developed countries. Naturally, there were also many other reasons that combined to make the idea catch on as fast as it did.

But not only did Danish farmers establish the first milk recording society. Danish farmers also set up the first A.I. society. This and many other occasions when Danish farmers took an independent initiative and co-operated in realizing activities for the common benefit - regardless of property sizes or whether this or that person got more or less out of it - bears witness to the fact that as early as in those days, the Danish farming community was well-informed and well-educated. The farming community of those days were equal to the task of realizing their ideas and establishing well-functioning organizations without being ordered to do so by the law-makers, although they often received state support for their activities. And since then, Danish farmers have accomplished many similar tasks.

Apart from the milk recording societies we could mention such examples as the co-operative dairies and slaughterhouses, the co-operative feedstuff wholesale societies, the co-operative societies for the purchase and sale of fertilizers and the totally impartial advisory services run by the users themselves.

Today, the value of these initiatives is that Danish farmers hold sole financial responsibility for their products all the way from "conception to consumption". There are virtually no outside investors who can demand their share of the profits!

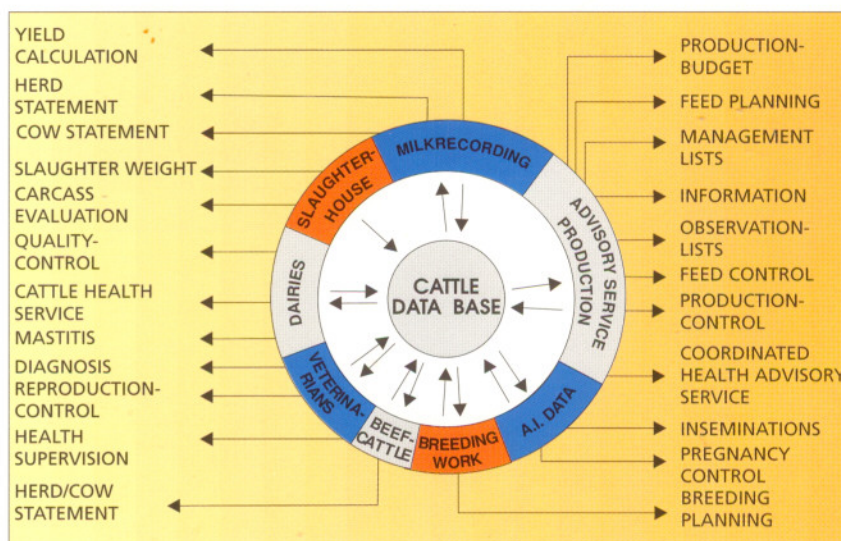
For that matter, the dairy cattle milk recording scheme, which is now run on an entirely voluntary basis and covers approx. 86% of

all dairy cows in Denmark, is only one of these activities. But still!

Today, the milk recording scheme forms the basis of the central Cattle Data Base which is quite uniquely structured. A few other countries have similar cattle data bases, but none of them have been able to organize a co-operative structure which is as comprehensive as the Danish version. No doubt this is due to the reasons already given above.

It is impossible to give a short description of the value, which the Cattle Data Base has to present-day herd owners. But in relation to our endeavours to provide each individual cattle farmer with a range of efficient services, it is of inestimable importance.

Figure 1. The central cattle data base depends on the milk recorders.





### **Historical background**

It is impossible to give a thorough and scientifically correct historical description of all the events that have taken place over the past 100 years within the compass of this Jubilee publication.

Below I will therefore concentrate on giving a concise account of historical developments within three main areas:

- The activities of the milk recording societies
- The National Committee of the Danish Milk Recording Societies
- International co-operation

### **The activities of the milk recording societies**

Only a few years after the first milk recording society had been launched in 1895, a nationwide collection of statistical data on such subjects as yield results, number of members, number of cows, etc. was initiated. A considerable amount of published material is therefore available on the activities and results of the milk recording societies, i.a. "Oversigt over regnskabsresultater i de danske kontrolforeninger" (a survey of the accounts of the Danish milk recording societies), vol. 1-38, by adviser Tage Andersen, Roskilde(1), to which I refer persons with a special interest in detailed studies of the subject. A few di-

stinctive features will, however, be mentioned here.

The number of milk recording societies rose steeply at the beginning of this century and reached its peak in 1939/40, when a total of 1,817 milk recording societies had been registered. Naturally, the great number of societies was a consequence partly of the limited technical possibilities of that time (e.g. fat determination according to the Gerber method was performed on the farm by means of a portable separator) and partly of the fact that in the majority of the herds the A method was used, i.e. the milk recorder took all the necessary samples.

As a small matter of curiosity I might mention that during the first years, the number of members per society was a well-nigh sacred number, viz. 13 - it enabled the milk recorder to work for 13 days and take every other Sunday off. That is to say, in the beginning the milk recordings were performed once every two weeks. However, it was not long until it became standard to have the recordings performed at intervals of 3 weeks. Later the intervals were extended, and this trend has not yet stopped.

Naturally, the first 50 years of the Danish milk recording societies were characterized by the two world wars, when the feed-stuff situation was very difficult. In between the wars, the economic crisis of the thirties had to be lived through, and the difficult times caused many farmers to drop out of the milk recording

schemes. And incidentally, those first 50 years have been brilliantly described by the first milk recorder, Mr. Emil Konradi.

This description can be found in the work entitled "Eliten af danske kvægopdrættere og kvægracer" (the élite of Danish cattle breeders and cattle breeds), vol. I, Jutland, published by Killigrens Forlag in 1949(2). I refer specially interested persons to that work.

Emil Konradi, who was a trained dairyman, was employed as a milk recorder at the "Vejen & Omegns" Milk Recording Society for 3½ years, until he decided to take a degree at the Royal Veterinary and Agricultural University in Copenhagen. Later he became a teacher at the agricultural school of "Ladelund Landbrugsskole", where he worked for most of his life.

I would, however, like to point out two of the subjects mentioned in Konradi's description of the first 50 years of the milk recording societies:

As early as in October 1897 - i.e. only 2½ years after the establishment of the first society at Vejen - the Audit Committee (!!!) of the Federation of Jutland Farmers' Unions called the first joint meeting of the chairmen of the milk recording societies and the milk recorders. This committee, which was set up at the Federation's 1896 delegate meeting, was chaired by the well-known "organizationalist" Mr. Anders Nielsen of Svejstrup Oestergaard, and was a great support to the cause of the first milk recording societies(2). Thus the Audit Committee organi-



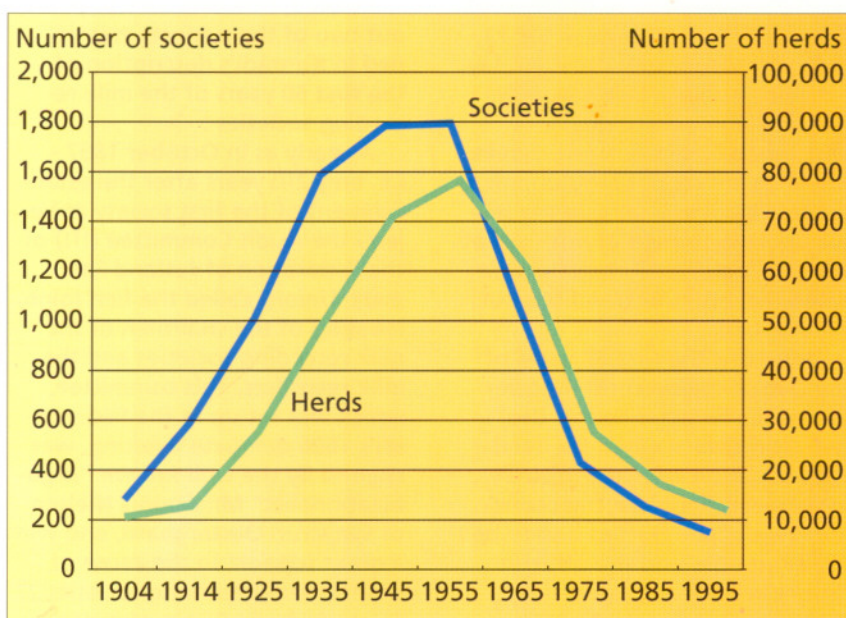
zed the joint meetings of the milk recording societies of Jutland for 14 years until 1911, when they were reorganized and turned into the Annual meeting, which was organized by the Federation of Jutland Farmers' Unions' Committee on Animal Husbandry. Seen in history's rear mirror it seems perfectly natural to wonder why this very committee was only brought into play at this late stage, but as far as can be made out the committee primarily concerned itself with horse breeding and the keeping of herd-books. The annual meetings were continued in this form until the Danish National Committee on Cattle Husbandry took over in 1972, when their first annual meeting was held.

The second subject mentioned by Emil Konradi serves to demonstrate that the milk recording societies were internationally oriented as early as at their very beginning. In 1911 the 5th international dairy conference was held. It took place in Stockholm, Sweden and was attended by representatives from nearly all European countries and from America and Japan! Emil Konradi contributed a paper on the work of the milk recording societies. He drew the following conclusions(3):

1) *The recording scheme supplies information about what yields can be achieved by feeding 100 SFU, i.e in the shape of milk, butter and daily gain.*

- 2) *The recording scheme tells us something about the production value of an animal and can be used as an important basis for selecting breeding animals.*
- 3) *The recording scheme supports the farmers' accounting work.*
- 4) *Eventually, all branches of a farm's activities should be included in the recording scheme enabling each individual farmer to gain a complete overview of the internal transactions of his farm.*
- 5) *At society level the recording scheme can be run at the lowest possible costs.*

Figure2. No. of societies and herds.



At the conference, the importance of the milk recording societies was discussed at great length and subsequently a resolution was adopted, which essentially gave the work of the recording societies the final seal of approval as the indispensable aid it had become - and still is - in relation to cattle breeding and cattle farming.

The resolution read as follows(3):  
*"On account of the excellent results achieved by the milk recording societies in Denmark, Sweden, Norway, the Netherlands, Germany, Finland, and Austria the 5th international dairy conference hereby declares that milk recording societies represent one of the best aids in the promotion of cattle breeding activities; they*



contribute to a reduction of the costs of milk production and to increasing the same. Moreover, the conference draws attention to the great importance of the milk recording societies in relation to the introduction of rational and financially viable feeding strategies, a systematic book-keeping system and their importance in relation to the dissemination of information about the very valuable experiments, that are being conducted within the field of cattle husbandry".

Since then, the technical implementation of the milk recording scheme and the utilization of the resulting data has become considerably more sophisticated - overwhelmingly so as it would seem to many. But we, who have now for a number of years been involved in this work in one way or the other, ought probably to take advantage of a quiet moment to ask ourselves this question: How many original new ideas have we been able to contribute?

Seen in the light of the above description I think it would be safe to say that the development of new technical aids have just given us some possibilities that our predecessors did not have. Nothing new has been contributed to the basis on which it was all built - and this only serves to demonstrate the foresight of the founders.

**Development in the number of milk recorded herds**

In the '40s and '50s the number of milk recording societies was almost stable, whereupon the

possibilities for rationalization that came with central fat determination and the computerization of the milk recording accounts soon led to a drop. In 1994, the number of societies had thus dwindled to 60, which is the lowest number that has been recorded this century.

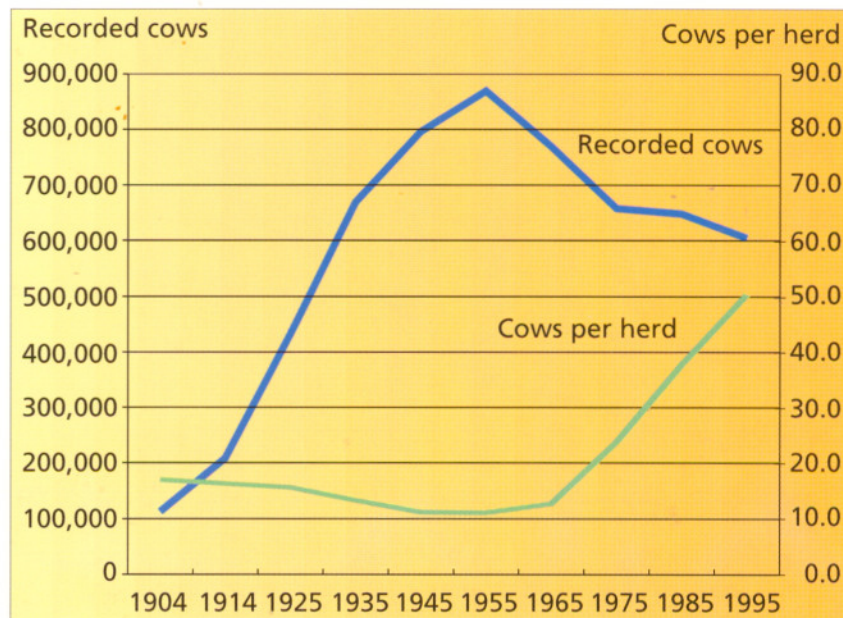
The number of milk recorded herds reached its peak in 1957, which was just about the time when the number of societies began to decline.

Measured in the number of milk recorded cows, participation in the milk recording scheme culminated in 1954, when it included approx. 875,000 cows. Since the late '50s the number of milk recorded herds has dropped by 85%, whereas the number of

cows has only dropped by 30% - an indication of the fact that the number of cows per herd has undergone a drastic change during the last 40 years, namely from 11 cows per member to 51 at the moment!

The drastic developments demonstrated by the figure are also a reflection of the great changes which - for several reasons - have occurred in Danish cattle husbandry since the Second World War. Many farmers gave up cattle farming in favour of pig farming, which among other things was a step on the way to specialization. The production conditions of cattle farmers were extremely difficult in consequence of the complicated regulations applying to exports to our neighbouring coun-

Figure 3. No. of cows and cows per herd





tries to the south after the establishment of the Common Market and during the period that passed until Denmark joined in 1972. The trend involving a "migration of cows" to the western parts of Denmark accelerated, etc.

The picture looks a lot better when we turn to an analysis of yield developments. In this area it is truly justified to talk about an increase in productivity that has been considerably larger than anybody could have imagined.

However, the true values that accrue to the herd owner from voluntary agricultural activities cannot be measured in terms of yield results, cows per herd, number of societies, etc. even though such figures are also important.

If anything, the crucial question is whether the farmers feel that the services offered by the milk recording system have such merit that the individual herd owner feels that he has been given value for his money.

The proportion of the total cow population that participates in the milk recording scheme is thus the best imaginable expression of the herd owners' general opinion of the advantages to be gained by being included in the scheme.

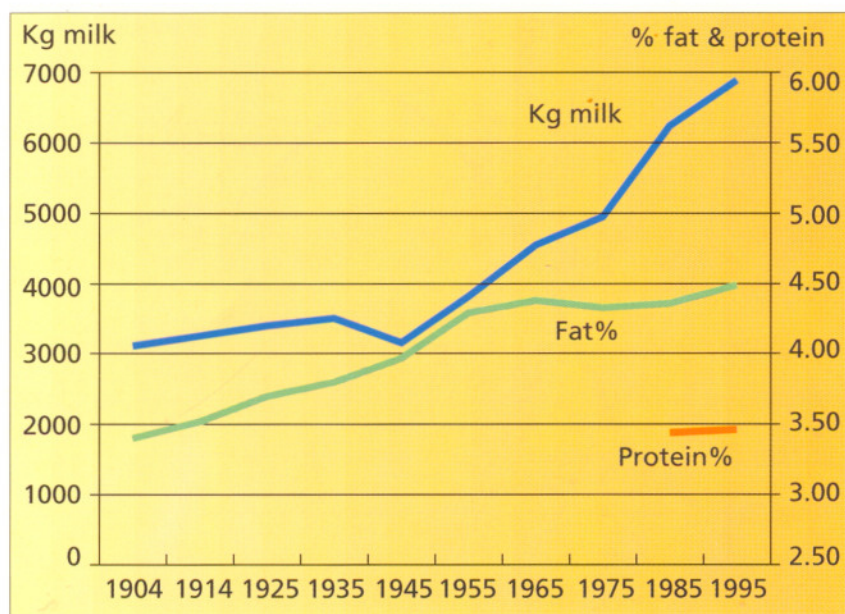
As you can see, participation figures have never been higher, and in this connection we would like to point out that in Denmark the milk recording scheme is a service that relies solely on the users for its finances.

A number of factors have each had an influence on the rise in participation figures. In this connection we should mention protein determination, which was introduced when the protein content of milk began to acquire increasing importance in the pricing systems of the dairies. Another thing that should be mentioned are the somatic cell counts that were also introduced as a consequence of the increasing demands of the dairies. Another important factor is the data that result from milk recording and which form the basis of various agricultural production management tools. The Danish advisory services can now offer a wide range of such tools, but they all have one thing in common, and that is that they can only be efficiently applied if there is a firm basis to build on, viz. a reliably run milk recording system producing calculations that are kept up-to-date on a current basis, and that all relevant parties have access to these updated herd data. There is nothing new in that, as this was the exact reason why milk recording was introduced in 1895, but since the Second World War developments in this field have taken place at an overwhelming rate.

#### **The role of the milk recorders**

An unverifiable but nevertheless very charming story has it that Mrs. Anine Hansen of the Askov experimental station was the one who suggested that the person, who was employed by the milk recording societies to perform the practical milk recording tasks,

Figure 4. Yield developments since 1945 (milk, fat/protein)





should be called a milk recorder. It is, however, quite certain that this name is as old as the milk recording societies themselves.

During the many years that passed until central gerberization was introduced causing society amalgamations to gather momentum - it would be safe to say that the milk recording societies depended on the personality of the milk recorder and on the work he did for an in the society. For many years, holding the position of milk recorder was considered very respectable.

A humorous story from Funen has it that in terms of social status the established order in the parish was as follows: the vicar, the parish clerk, the milk recorder, the parish bull!

The social influence of the milk recorder has not received much attention. It was nevertheless great, always provided that he possessed the right qualities - which was of course not the case with all milk recorders. For many years it was considered a very valuable link in the education of many farmers to have worked as a milk recorder for some time. In this way the future farmers gained valuable accounting skills and a good insight into the management abilities of the various members and their way of treating animals and humans. It was thus a very instructive job if you had the ability to profit by what you experienced.

It was thus also not uncommon that many leading people in the farmers' organisations and in political life - and among cattle breeders - had held the job of a milk recorder for some time.

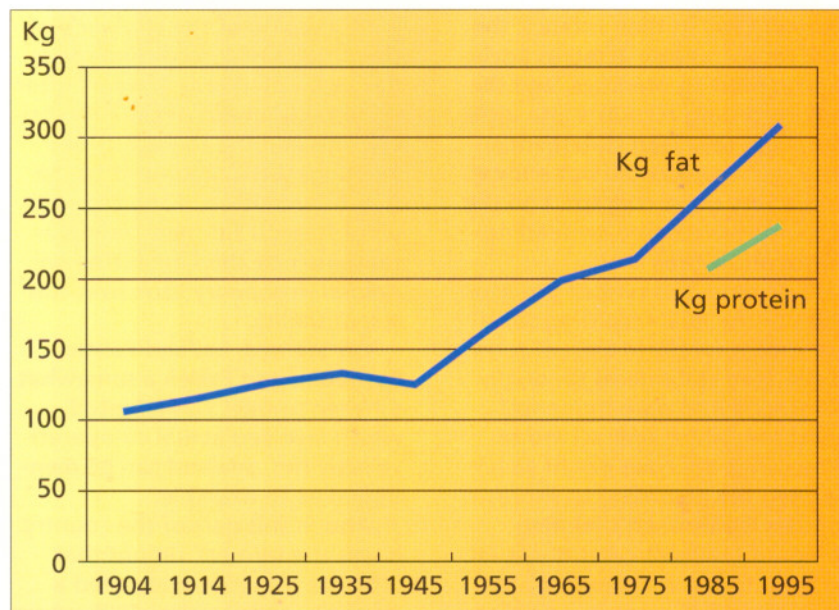
der for some time.

Seen with present-day eyes it is only a small detail, but one that carried great importance with many young farming families, as the milk recorder was the only person with a steelyard to visit the farms on a regular basis. And it was thus a common thing that he weighed the babies and young children, and in this way he was also took part in their lives. He was the health visitor of those days - so to speak. A steelyard was considered a treasure, so the milk recorder and the family got to know each other well in this way. Out in the small communities, people took an active interest in each other's joys and sorrows!

In former times, the milk recording regulations stipulated that

the herd owner was not to know in advance on what day the milk recorder would arrive. This represented a completely insoluble predicament, as the milk recorder had to live on the farms. No doubt, there are countless stories of how this problem was solved. One version, which the last chairman of the National Committee of the Danish Milk Recording Societies, Mr. Poul H. Andreassen of Karise used to tell, ran like this: the milk recorder inquires - "Will you be at home on Thursday?" "Yes," was the answer. "Will XX also be at home?" "Yes, he will." "Well, that's good," says the milk recorder. "I know that YY will also be at home. And as we all know, it is best to be four for a game of OMBRE!"

Figure 5. Proportion of milk recorded cows.





The somewhat larger societies offered a perk that many milk recorders looked forward to, namely those who wanted to stay on as milk recorders, and who thus wanted a permanent home. In all parts of the country many milk recorders have since been able to celebrate their Silver Jubilees, and were usually quite deservedly celebrated by the milk recording society members at the local village hall.

The working conditions of modern-day milk recorders have changed quite a lot, but they still get to be at close quarters with the farmer's way of running his cattle farm and treating his animals, so the same requirements of loyalty and discretion still apply, but the relation to the farmer's wife and his children has been severed.

When the milk recording societies were still in their infancy, the milk recorders also acted as advisers on feeding practices, and the milk recording accounts also included a per cow feed statement. They had thus started out embracing a very good concept, and the accounts were based on feeding advice and a feed plan.

Over time, this part of the activities of the milk recording societies took a totally irrelevant turn, as the feed statements gradually developed into pure numerical nonsense, which only served to show what the cows ought to have been fed according to professor Lars Frederiksen's feeding standards. In most cases it was impossible to tell whether they had really been fed according to plan.

It is not known whether the reason for this was lack of support from the members or from the society management, or whether the milk recorder simply lacked an interest in advisory services.

Anyhow, the milk recording societies did not make a good job of this important part of their activities, and modern cattle husbandry advisory services - under the auspices of a cattle husbandry committee - emerged instead. But of course the milk recording system still forms the basis of these services.

### ***The National Committee of the Danish Milk Recording Societies***

As mentioned previously, a joint meeting of the chairmen of the Jutland milk recording societies was called only 2° years after the establishment of the first society. This and the following 14 meetings were organized by the Audit Committee of the Federation of Jutland Farmers' Unions - subsequently the Committee on Animal Husbandry took over this responsibility.

On Sealand, Lolland-Falster, Bornholm and Funen a somewhat different model was adopted, which involved actual co-operative activities. Sealand can be mentioned as an example.

Also in this part of the country it was the farmers' unions that took the initiative and called a meeting in September 1899 where

the draft articles of a "Confederation of Sealand Milk Recording Societies" were presented. This co-operative association was to be responsible to the Federation of Farmers' Unions in the Diocese of Sealand. The co-operative association was subsequently formed on the 22 May 1900.

Seen in the rear mirror of time it seems rather remarkable that a need to co-operate was already felt so soon after the establishment of the first milk recording society. The old records show why. The fact was simply that as everything was so new, one had not yet found ones bearings, and an almost Babylonian confusion arose as to the correct number of milk recordings, the training of the milk recorders, accounting problems, technical problems, purchasing printed matter, acid and amyl alcohol, etc., etc.

The societies had their work cut out for them. One of the first agreements, which they entered into, was with the "Steins Kemiske Laboratorium" (chemical laboratories). So the milk recording societies and Steins Laboratorium have known each other for nearly 100 years.

Activities at provincial level were of very great importance, and as far as can be deduced from the various sources, a co-operative network was established to take care of such questions as accounting, requirements applying to the training of milk recorders and to the quality of their work, as well as the organization of annual meetings, where current subjects could be discussed.



We can see that there was some degree of contact between the provinces(3) but no real co-operation. This did not come until 1932/33.

### **The formation of the National Committee of Danish Milk Recording Societies**

Regrettably, the minute books of this Committee have gone missing, but based on the minute books of the Confederation of Sealand Milk Recording Societies (4) and a report from the annual meeting (held on the 17 and 18 November 1933) of the same association, the formation of the National Committee can be pinpointed to the recording year of 1932/33.

This meant the initiation of a nationwide co-operative system that continued to be in place until the National Committee was abolished in 1972, and its activities were taken over by the Danish National Committee on Cattle Husbandry's sub-committee on milk recording.

The National Committee of Danish Milk Recording Societies was a joint committee consisting of the following associations, etc.:

- The Federation of Jutland Farmers' Unions
- The Federation of Cattle Breeding and Milk Recording Societies in the Diocese of Funen
- The Confederation of Lolland-Falster Milk Recording Societies
- The Confederation of Bornholm Milk Recording Societies

- The Confederation of Sealand Milk Recording Societies

During all the years when the National Committee was in place, it had its offices at the address of the Confederation of Sealand Milk Recording Societies. During the first four years adviser H.P. Olsen worked as secretary and day-to-day head of the Committee offices, until on the 1 April 1937 he was succeeded by adviser Tage Andersen, who held this position until the abolishment of the National Committee in 1972.

### **What were the main tasks of the National Committee**

Primarily, the National Committee was the official representative of the Danish milk recording societies in all matters concerning the affairs of the milk recording societies - nationally and internationally.

Next, the training of the milk recorders, their working and employment conditions represented a main area on which much attention was focused. In this connection it should be mentioned that the National Committee gave its approval to the "Lærebog for kontrolassistenter" (textbook for milk recorders), the first editions of which were written by adviser Schmelling of Aarhus. The National Committee later assumed the responsibility of preparing and publishing this textbook.

The area, which probably attracted the greatest degree of attention from the surrounding world to the activities of the National

Committee, was the annual "Oversigt over regnskabsresultater i de danske kontrolforeninger" (Statement of accounts and report of the Danish milk recording societies), which for many years starting immediately after the last War - in addition to the Danish version - was also published in both German and English and sent to all of the many societies, institutions and individual persons all over the world to which the National Committee had contacts. This helped to spread well-documented information about the production results of Danish cattle farming, and clearly part of the credit for the fact that we have now been able to keep up our exportation of breeding animals for so many years can also be ascribed to this initiative.

The translated versions of these reports were the direct forerunners of the Danish National Committee of Cattle Husbandry's annual "Summaries", which are now only published in English.

### **International co-operation**

Within the field of milk recording there are very long traditions for international co-operation. Very early the exact same need to be able to compare yield results, etc. across the borders of Europe emerged that had also arisen between the Danish provinces, and which led to the formation of the National Committee of Danish



Milk Recording Societies. Possibilities for comparison across national borders will of course only be available, if results are calculated by means of homogenous methods in the widest possible sense.

As early as in 1923, these questions were raised at an international agricultural congress in Paris(5). At this congress the following statement was adopted: "As regards the milk/butterfat recording of dairy cows there exists a need to standardize the recording procedures of the European countries. In particular it should be recommended that the milk and butterfat yield results are expressed in the same terms".

As written by Mr. Cattin-Vidal, president of the ICRPMA (later renamed ICAR), in "Milk Recording in top form for its hundredth Birthday!", Paris, 1990(5), precisely the same point was brought up the same year at The Hague in Holland by "such excellent cattle breeding experts as Dr. Hansen of Berlin, Axel Appel of Aarhus, Denmark and J. Mesdag of Leewarden in Holland". Nevertheless, the individual countries persevered in maintaining their very dissimilar recording intervals and somewhat differing lactation periods - and i.a. on the part of Denmark also a different milk recording accounting year.

In 1930, at a congress at Liege in Belgium, yet another proposal to do something about this matter was put forward.

In 1935 it was again discussed! Still the debate turned especially on the question of recording intervals, and many experiments

were carried out to determine what interval would lead to the most correct results. There were also controversies about calculation methods. In 1931 an International Dairy Congress was held in Copenhagen(5), where a number of somewhat more specific proposals were tabled. These proposals, which have, however, not been specified in detail by the source(5), were discussed by the same forum at later congresses in Prague and Budapest. Cattin-Vidal(5) mentions that some conflict or other had come up between the interests of the milk recording and the herdbook associations. So far this conflict has still not been entirely solved, and here in 1995 many countries still have herdbook associations, which live off registration duties, that represent quite superfluous expenses to the affected cattle breeders. The data they pay to have registered has already been explicitly recorded in the data base of the milk recording scheme! Fortunately, we have been able to avoid these double registrations and double fees in Denmark.

Then came the Second World War - and everything came to a standstill - except such activities as those that had to do with the war. And still!

When the war ended in 1945, there was a lot of pent-up mental activity and strong inclinations to make progress within all areas and on an international level. As early as between the 23 and the 25 April 1947, a very important meeting was held under the auspices of F.A.O. in Rome. The

result that emerged from this meeting was the initiation of an analysis or investigation of the milk recording methods then being applied in the European countries. In addition, a commission was set up, which was assigned the task of analyzing the standardization possibilities on the basis of the results of the above-mentioned investigation. In December 1947 the members of the commission met to draw up a proposal, which was sent to all of the F.A.O. member countries. This proposal was also presented at a European congress in September 1949. On the basis of these activities a seven member task force was set up, one member of which was Tage Andersen of the National Committee of Danish Milk Recording Societies. The task force also included Danish observers, among whom was Mr. H. Ærsøe, head of department at the Agricultural Research Laboratory (subsequently the National Institute of Animal Science).

After a "gestation period" of nearly 30 years, an international organization, which had been given the task of standardizing milk recording methods in the widest possible sense, finally saw the light of day between the 5 and the 9 March 1951 at a meeting in Rome.

The first regular meeting of the "European Milk Recording Committee" was held at the Dutch Ministry of Agriculture in The Hague.

The secretariat of this organization was established in Rome in conjunction with the EAAP (European Association of Animal Pro-



duction), where it has been since. The distinguished secretary general of the EAAP, Dr. K. Kállay, was also appointed the first secretary general of the milk recording organization.

As has already appeared from the above, Denmark was among the founders.

Since the formation of the International Committee for Animal Recording (ICAR), which is the supposedly permanent name this organization was given around 1990, 29 so-called sessions have been held. They are now held every other year, and have only been held outside Europe twice, viz. in Israel in 1974 and in Canada in 1994.

ICAR, which now has almost 40 member countries, has obtained the status of an international organisation with a decisive influence on all questions concerning the recording of milk yields and weight gains as well as on all related questions.

The task was to standardize milk recording methods. And this task has been solved, but as ICAR changed its status from a European to a truly international organization, the practical possibilities existing in the newly affiliated countries had to be taken into consideration. At present there are thus a fair number of approved milk recording methods, that are well-documented and which will therefore yield comparable results, provided the applied basis of calculation is stated.

Among the other tasks, that have been solved, are approval procedures (including accuracy

definition and control standards) for milk meters and methodological descriptions designed for the laboratories that perform fat/protein determinations. In addition, such tasks as weight gain recordings and milk recording standards for goats have been included.

Most of this work is undertaken by working groups during the interval between the sessions, and these working groups are set up at the ordinary sessions. After a working group has solved the task assigned to it, it will typically be abolished, or if important control measures/approval procedures remain to be laid down, it will be turned into a permanent sub-committee, which was e.g. the case with the working group on milk meters.

Interbull is another sub-committee under ICAR, which is just now at the point of being able to present the first transnational progeny tests for bulls. This has been sorely missed for decades! In future the exchange of breeding material can thus to a much larger extent than was so far the case be based on scientific analyses, rather than on the sales promotion material of clever public relation people.

The reason why this has now become possible is primarily due to the fact that the objectives, that were set up many years ago by the visionary, European scientists and leading personalities in the milk recording organizations, have now at the time of our 100 year Jubilee to a very large extent been achieved.

The activities and agricultural efforts, for which the foundation stone was laid at an 1894 Christmas party and which led to the establishment of the "Vejen & Omegns" Milk Recording Society on the 24 January 1895, have thus acquired an importance, which must surely seem inconceivable to the initiators, if the few people of those days were able to see what many of us here today consider a matter of course.

That is certainly worth celebrating, and all present-day cattle breeders in all of ICAR's member countries owe these men - and this one lady - a great debt of gratitude. ■

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# The Importance of the Milk Recording Societies in Relation to the World's Dairy Cattle Production

By Wim M.G. Wismans, president of ICAR

## International history

From the mid-19th century, and increasingly towards the turn of the century, farms, institutes and animal production societies in Europe and the USA began the practice of "test milking" to identify the best animals for breeding. Associations, like the Holstein Friesian Association in the USA (starting in 1883) and the Friesian Herdbook Association in The Netherlands (from 1893), also ran tests.

Professor André Max Leroy, in one of his many books, pinpoints the origin of milk recording to the moment when it became possible to replace daily tests with periodic tests. This possibility was demonstrated by Fleischmann and his collaborators after nine years of observations of a herd of sixty dairy cows. Their conclusions were first put into practice in Vejen, on the Jutland peninsula, Denmark, on April 29th 1895.

That was the birth of milk and butter recording. Not only at the beginning of milk recording but also during the long history of milk recording, did Denmark give an active and very appreciated contribution to the development of the practice of milk recording.

After various adaptations and refinements, the milk recording system was adopted in turn by the Swedes, Germans and Dutch, and

then it gradually spread to all countries with an economically important dairy industry.

In Denmark, three years after the establishment of the first milk recording society at Vejen, 45,000 cows were being recorded; by 1912 the figure was 200,000 out of total cow population of about one million. An impressive result. Denmark was far ahead of other countries that had adopted milk recording schemes.

The methodology had not yet been firmly established, however, and there was much controversy over errors due to the use of periodic testing as compared to daily tests. Wildly fantastic figures were quoted, with allegations of a 15% margin of error for monthly testing.

Reliable experiments yielded the following results, however:

weekly tests	twice monthly tests	21-day tests	monthly tests
+1.04%	+1.48%	+2.08%	+2.68%

In fact, the countries that had grasped the usefulness of milk recording, chose intervals ranging from seven days to two months, depending on their aims and conditions. Short interval recordings were generally carried out by the farmers themselves, while longer interval recordings were performed, as a rule, by specialist milk recording technicians trained for this purpose. Many countries chose a combined system with fairly frequent tests carried out by the farmer and less frequent control

tests carried out by a professional.

The key factor at the time was milk fat content or, more precisely, butter fat. One was also beginning to discuss whether measurement of milk dry extract and casein should be performed.

As early as in 1923, the countries that had set up milk recording systems were already attempting to standardize test methods and the form in which results were expressed.

But the milk recording systems made progress, and a first assessment of the situation worldwide, published by the International Institute of Agriculture in 1924 under the title of "Dairy Cow Recording in Different Countries", listed twenty countries practising milk recording, with a combined total of 1.8 million milk recorded cows.

Eleven years later, in 1935, the same Institute of Agriculture issued an updated assessment under the title of "Dairy Cow Recording Worldwide". Milk recording was now being practised in thirty-four countries and involved 14,000 practising milk recorders, 285,000 farms and 4.5 million cows.

After many attempts to standardize European milk recording practices, a new group of experts was nominated in 1949 to draw up a definite text for submission



to the different countries' milk recording organisations.

The group drew up a draft agreement, which was sent to all countries for approval. It also proposed the creation of a European Milk Recording Committee, to be made up of representatives of the organisations signing the agreement.

After a "gestation period" of nearly thirty years, an international organization designed to harmonize milk recording methods, calculation procedures and the formulation of results, finally saw the light of day on March 5th-9th 1951 in Rome.

The European Milk/Butter Recording Committee thus held its first meeting at the Dutch Ministry of Agriculture in The Hague on July 14th 1951.

In 1970 its name was changed into "International Committee for Recording the Productivity of Milk Animals (ICRPMA).

Until 1982, its activities concentrated on milk recording systems. In 1982 the first proposal concerning the recording of meat performance was presented at Aarhus. In 1983 a working group on identification was started under the chairmanship of Arne Nielsen, Denmark. In 1988, ICRPMA set up a sub-committee which was assigned the task of laying down procedures of approval for milk recording equipment. This was an important historical step. The approval tests of ICRPMA were adopted by all member organisations.

The next step was that the Interbull working group of IDF,

EAAP and ICRPMA was reorganized into an ICRPMA sub-committee.

In 1990, the name was again changed as more fields of recording and also sheep and goats had been included. It was decided to change ICRPMA into ICAR - the "International Committee for Animal Recording".

In 1980, ICAR started publishing current figures on the situation of milk recording in the member organisations. The 1974 and 1993 figures express the growing importance of milk recording. The figures for Denmark, Germany, Sweden and The Netherlands are stated in annex 1.

In general it may be concluded:

- *ICAR has become a truly international organisation and especially milk recording has been standardized world-wide;*
- *Milk recording is still the most important activity within the field of recording data on animals;*
- *The A4-system (every 4 weeks/monthly recordings performed by an official milk recorder) is the most common system. In the Scandinavian countries, the B-system (do it yourself recording) is most frequently used;*
- *The subsidies of the Government and the dairy industry are decreasing on a world-wide basis;*
- *The productivity of the cows has increased considerably (about 100 kg/cow/year).*

- *The number of services offered by the milk recording organisations has increased, and costs expressed in kg milk have mostly decreased.*

#### **World's Dairy Cattle Production**

In 1992, the number of milk producing cows amounted to 225 million, which produced 450,000,000 tons of milk. On average, per cow production was 2,000 kg. In the ICAR member countries, average production amounts to over 5,000 kg. In other words, 20% of the world's cow population produces 50% of the world's milk production.

If we take a look at the differences that exist within the individual countries, it may also be concluded that the productivity of the milk recorded cows is much higher than the productivity of cows that do not participate in a milk recording scheme.

Mostly, the differences amount to more than 1,000 kg and sometimes to more than 2,000 kg.

Moreover, there are also differences in the quality of the milk. Milk recorded cows have higher fat and protein contents and lower cell counts.

Based on the activities of the milk recording organisations, the farmers can and will improve the productivity of the cows. Today, the quality of the milk is considered important, and the importance of milk quality will continue to increase. In consequence of the need for environmentally friendly production methods and the knowledge that farm production will increase, the milk recording



organisations are faced with the new challenge of supporting the farmers in their endeavours to increase production quality while costs are kept down.

In the developing countries there is a pressing need for continual improvement of milk production and productivity. Milk recording could be used as a pilot technology in our efforts to improve farm management in the developing countries. In 1994, ICAR decided that a special task force should work out a proposal suggesting in what way ICAR can initiate and/or support the introduction of milk recording schemes in developing countries.

#### **Benefits of milk recording**

In fact, there is only one reason why milk recording should be pursued, and that is to support the farmer in the management of his farm. This includes the information value of breeding values. Milk recording organisations have to be efficient.

In the past, the milk recording organisations were subsidized in many countries. In reality, subsidizing milk recording operation costs is not a good idea, when the aim is to increase efficiency and co-operation. Subsidies granted to promote new developments are, however, very welcome.

If animal identification and registration (I&R) systems did not exist, farm management and breeding programmes would not work. In conjunction with the herdbook associations, the milk recording organisations have not spared any efforts to keep up a

good I&R system. It may further be considered a must to co-operate with the animal health authorities, as is the case in Denmark and The Netherlands.

Another important point is the quality of the work. If recording errors are made, they cannot be corrected, not even by means of complicated statistical models. Therefore, quality control forms an essential part of the work, and the milk recording organisations have to report their results to a body which supervises the milk recording system.

In the new ICAR guidelines a paragraph about the supervision of the milk recording system has been included. This is a start. Quality control systems and international supervision regulations have to be worked out.

The need to carry out milk recordings does not need discussion. When cows produce 7,500 kg milk and the costs for milk recording are only 50 kg milk, it is really cheap. Therefore, it represents a challenge to the milk recording organisations to offer the farmer such quality services that the he is willing to pay the costs of milk recording.

#### **Efficiency and co-operation**

Today, the milk recording organisations offer a great number of management tools to the farmers. Examples are:

- financial value of a cow's production in comparison to her herd mates
- breeding values

- feeding advice
- somatic cell count
- quota plan
- culling plan
- reproduction plan
- sire advisory plan

Because of growing animal welfare and environmental demands and the expected lower price on milk, the benefits of farming will decrease. The need to translate production data into financial data will increase strongly. Milk recording has and will play a role as the driving force in the efforts to integrate the data of different organisations into one management tool.

Also new techniques (electronics) will influence farming more and more. The existing differences in the farming sector will therefore increase. The milk recording organisations must be able to offer alternatives to the farmer, so that the farmer can make use of a system that meets his requirements.

When we look at these developments, the need for co-operation between countries becomes clear. In practise, this will not be easy. Each country has its own system. Especially, an area like the development of new tools intended to support the farmer holds possibilities of co-operation.

#### **Conclusion**

100 years of milk recording is a milestone that deserves celebration. Denmark was and is a leading country in regard to recording activities. Much has been achieved



in the past, and as for the future there is a need to implement new methods and techniques to support the farmer in the management of his farm enabling him to produce high quality products that will guarantee the achievement of benefits from farming. It represents a challenge to the milk recording organisations be able to meet the requirements of the farmer in respect of co-operation on the national and international level.

On behalf of ICAR and all its member organisations, I extend my congratulations with the fact that it has now been 100 years since milk recording was introduced with the establishment of the "Vejen & Omegns" Milk Recording Society. ■

Table 1.

<b>ICAR</b>	<b>1974</b>	<b>1993</b>
Members	21	33
milk recorded cows	9 million	25 million
<b>% milk recorded cows</b>		
Denmark	60	83
Germany	40	70
Sweden	53	77
The Netherlands	61	77
<b>Milk recording system</b>		
Denmark	A4(34);B(55)*	A4(25);B(75)
Germany	A4(100)	A4(89);B(11)
Sweden	B(100)	B(100)
The Netherlands	A3(83);A4(17)	A3(23);A4(65)
<b>Price of milk recording (A4) (in kg milk)</b>		
Denmark	60	54(avr. A4 and B)
Germany	95	95
Sweden	-	81
The Netherlands	55	54
<b>% subsidy</b>		
Denmark	16	0
Germany	50	40
Sweden	37	0
The Netherlands	20	0
<b>Kg milk/cow (M.R.)</b>		
Denmark	4858	6891
Germany	4614	5982
Sweden	5424	7398
The Netherlands	4902	7220

**M.R. = milk recorded**

\*) Bracketed figures represents the percentage participating



# 100th Anniversary of the Milk Recording Society of Vejen and Environs

*By Holger Busch Nielsen,  
Lecturer on cattle husbandry subjects  
at Ladelund Agricultural School*

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The 24th of January 1895 and the 29th of April 1895 are milestones in the history of Danish agriculture. On January 24th 1895 was the founding general meeting and on April 29th 1895 the practical work commenced in Denmark's and the world's first milk recording society.

## **Background**

The 1880's were a time of progress and development for trade and industry in Denmark, and that applied to both spiritual, economic and technical aspects. A few examples should be mentioned:

American railways were established from the Great Plains to the ports on the Atlantic coast. This permitted American grains to be imported into Europe, and grain prices fell throughout Western Europe.

The agricultural sector in Denmark had to be converted from production of grains and oxen to production of domestic animals; first and foremost to the production of milk and dairy products but also to the production of pigs based on the skimmed milk.

After 1864, a number of folk high schools were established and frequented by large numbers of farmers' sons who had their self-esteem boosted and became determined to solve their own problems. In connection with the an-

niversary it is especially important to mention that the folk high school at Rødding was moved to Askov in 1866. Askov became a model for other folk high schools and acquired immense influence on developments in central Southern Jutland.

The technical development included the construction of the nationwide railway lines. The building of the railway from Kolding to Esbjerg in 1878 was to be of great importance to the agricultural sector as a whole, because direct export to Britain had now become a possibility. At the local level, the building of this railway meant that a number of big towns with stations sprung up out of nothing along the railway. Towns such as Lunderskov, Vejen, Brørup and Holsted could be mentioned as examples of that.

The period was also one of ferment within the field of dairy technology. They learned to cool down the milk with ice stored from the winter, and they developed better methods for skimming the milk. Many of the bigger farms produced their own butter of excellent quality. In the 1880's, the continuous centrifuge was invented. All of this required some sort of large-scale production that was beyond the reach of ordinary farmers, but the idea of joint usage of these modern techniques led to the establishment of cooperative dairies. The first one was in Hjedding near Ølgod, and it started operating on the 10th of June 1882.

The folk high schools and representative government gene-

rated a number of great personalities who cared about what was in the best interest of the people (and the people was the farmers). These personalities were often big farmers, priests, and principals of folk high schools and agricultural schools. They were catalysts in the establishment of the agronomical societies. Developments were beginning to be controlled by the farmers themselves to a great extent. They became chairmen of farmers' associations, dairies and savings banks.

## **The situation in 1895.**

One of these personalities was Niels Pedersen, the principal of the agricultural school at Ladelund. With a teaching background at Askov Folk High School, he established Ladelund Agricultural School in 1878. He was a pioneer in a number of fields. Scarcely a single cooperative dairy was established in the 1880's without Niels Pedersen being involved as some kind of adviser. Niels Pedersen had technological development of the dairy industry at heart, and his initiatives constituted the beginning of the establishment of an experimental service. Initially, it was the physical, chemical and bacteriological conditions of the milk that were examined. In this connection N.J. Fjord, a university lecturer, came into the picture as the man who was able to solve the problems. This interest in the conditions of the milk soon led to greater interest in the cows and how they were fed. The cooperation between N.J. Fjord and Niels Pedersen led



to the establishment of the Agromical Experimental Laboratory, later to become the National Institute of Animal Science.

At the cooperative dairies they soon learned the lesson that "milk is not just milk". The principal production was butter, and it was found that the volume of milk required for producing a pound of butter varied from 45 pounds of milk to 18 pounds. We now know what that meant: bearing the production conditions of that time in mind, the fat percentage must have varied from approx. 2 per cent to approx. 5 per cent.

An equitable settlement of the milk required examination of the value of each individual supplier's milk. This led to the development of test churns and equipment for determination of the cream percentage. In 1892, doctor N. Gerber in Zurich, Switzerland, developed a fat determination method that was accurate, quick, uncomplicated to work with, and inexpensive. Gerber's Fat Determination Test (Gerber's Test) could be applied not only to supplier milk at the dairies but also to the milk of the individual cows.

Payment for the milk according to its butter value was a strong incentive for each supplier to "work diligently towards producing fat milk". Mr Fjord's experiments indicated that the feed had some influence on the composition of the milk. For example, mash and hogwash produced thin milk, whereas palm and coconut cakes produced fat milk. However, it was generally held that the feed played only a subordinate

role in relation to the fat content of the milk. The ability of the cows to produce fat milk was an individual quality, and, as such, it had to be hereditary. Consequently, breeding was the road to achieving fatter milk. This requires knowledge of the fat content of the milk of each individual cow.

All of this was clearly perceived by Niels Pedersen, and he had kept records of the individual cows in Ladelund Farm's herd since 1890. Not only did he keep records of the yield, he also kept records of the feed so that the production price of 1 pound of butter could be calculated for each individual cow. Niels Pedersen strongly advocated his case, but it was a drawback that the fat determination equipment was costly, and some training was required for using it. In other words, determination of the fat content in milk, just as the establishment of the dairy industry, was a task which required that forces be joined.

It is told that the matter of keeping records of the cows was discussed by the farmers around Vejen at the Christmas get-togethers in 1894. Mrs Anine Hansen (the wife of Frederik Hansen who owned the farm Øster Haugaard near Askov, today the Askov Experimental Station) also took an interest in the matter, and she suggested that they stopped talking and took action instead.

As a result, a founding general meeting was called for the "Milk Recording Society of Vejen and Environs", to be held at Lille Skov-

gaard, the farm of Mr Søren Peter Knudsen, on January 24th 1895. The 13 "major" farmers, with about 300 cows, drafted the articles of association of the Society and decided to start the practical work as soon as possible.

The articles included some of the following main items:

- The object is to establish strains of cows that produce large quantities of fat milk.
- The Society is established for a period of five years, and membership is mandatory for all members for five years.
- All milk producing cows shall be checked once every other week.
- The expenses shall be distributed in accordance with the number of fat determination tests.

A Gerber's apparatus shall be purchased, and the Society shall hire a milk recorder whose task it shall be to keep precise records of each individual cow's milk, butter yield and feed consumption. In addition, he shall prepare a summary of the hereditary interrelations of all individuals in order to make it possible to pick out animals with breeding values that will have a positive effect on breeding in general.

The members were the biggest farms in the area, including Ladelund, Dorotheasminde, Lille Skovgaard, Vandamgaard, Grønvang,



Askov Folk High School and Øster Haugaard. The number of members, thirteen, was almost a holy figure. This meant that it was possible to record milk every 14th day, and the milk recorder could take every other Sunday off.

Emil Konradi, a trainee at Ladelund, was trained to perform the work of sampling, taking Gerber's Test and recording. The preparations were made, and on April 29th 1895 the first milk recording was carried out at the farm Dorotheasminde, owned by doctor Boe Bojesen. Consequently, that date can be chosen to mark the 100th anniversary. Mr Konradi's salary was DKK 410 for the first year, and the next year it was increased to DKK 505. Mr Konradi

later graduated as an agronomist and went on to have a long career as a teacher at Ladelund.

#### Later developments

The Milk Recording Society of Vejen and Environs became the model for hundreds of societies that were soon to be founded all over the country. In the very same year, 1895, milk recording societies were established at Askov and Aagaard, for example, and Brørup followed in 1896. By 1910, a total of more than 500 societies had been established. The other Scandinavian countries followed the same procedure, and later on the other European countries also copied the idea, although often in the form of services established by

the state rather than the farmers.

The new societies scarcely managed to live up to the lofty ideals of the Milk Recording Society of Vejen and Environs with regard to the frequency of testing and keeping very precise feeding records. Many of these societies had 19-20 members, and testing was thus carried out only once every third week. In addition, small family farmers were also admitted into the societies; they had to do the sampling and weighing of the feed themselves, and the milk recorder subsequently did the Gerber's Test and kept the records. Moreover, there are examples of two small herds sharing a milk recorder, doing the sampling themselves every other time.

Tabel 2.

Milk and butter yields								
	No. of cows for 365 days	lbs/kg milk	% fat	lbs/kg butter	lbs/kg fat			
1903-04	250	6,715	3.47	259	233			
1908-09	257	6,374	3.43	243	219			
1921-22*	198	3,251	3.78	137	123			
Feed units consumed ("pound feed units" / "kg FU")								
	Oil cakes	Other conc.	Beets	Pasturing	Forage	Hay	Straw	Total
1903-04	977	333	921	1,112	259	603	273	4,478
1908-09	877	321	1,115	1,353	248	308	319	4,541
1921-22	623	84	852	722	70	145	2,496	
Daily per cow		100 feed units produced			Days of		Average	
	lbs/kg milk	FU	lbs/kg milk	lbs butter	lbs growth	DKK earned	pasturing	veight, lbs
1903-04	18.4	12.3	150	5.79	1.8	6.36	97	909
1908-09	17.5	12.5	139	5.30	1.1	60.9		897
1921-22*	8.9	8.2	130	5.50				

(NB: The metric system had been introduced in 1912).



When a sufficiently large number of cattle farmers had stated their wish to be admitted into the milk recording society, a new society with between 13 and 20 members was ordinarily established. The Milk Recording Society of Vejen and Environs, however, chose a solution with two districts. Three or four new societies were formed within the original area, for example the Ladelund Milk Recording Society. The agricultural school initially continued its own very comprehensive testing and recording work but joined an ordinary society later on.

The Milk Recording Society of Vejen and Environs continued abiding by its lofty ideal all the way up to the 1920's. They did not wish to compromise on their original objective, namely to prepare total records for each individual cow. In 1899, the Society acquired a cattle balance for DKK 160, and they ordered a carriage for it from the local wheelwright. They then weighed the cows, heifers, etc. twice a year, thereby becoming able to prepare a proper growth record. The balance became the property of an independent society which financed it by taking a ten-year loan at the savings bank. Operation was paid for by charging DKK 0.05 per animal weighed. The balance had such a great capacity that it could be hired out to the neighbouring society. When the balance had been paid, they continued to charge a weighing fee and saved up an interest earning capital that could pay for a new balance and carriage in 1917. In addition, the

balance society, complying with a decision made at its general meeting, paid for the coffee served at the annual general meeting of the milk recording society!

The feed records were kept by the societies on the basis of "test weighings" of the feed. The feed was converted into feed units, and we have to remember that the feed units were measured in pounds. The "ordinary proportions" were used: 1 feed unit = 1lb oil cakes = 1lb grain = 2lbs full milk = 6lbs skimmed milk = 10lbs stock beets or kohlrabi = 12lbs turnips = 2 - 3lbs hay = 4 - 6lbs straw = 8 - 12lbs forage. Pasturing is often calculated as 7 feed units plus 0.25 FU/lb of milk.

The following are examples from the Milk Recording Society of Vejen and Environs from 1903-04, 1908-09 and 1921-22, comprising the original 13 members (note: the metric system, including the transition from pounds to kilos, was introduced in 1912).

#### **Progress through breeding**

Quick progress was expected to be achieved through breeding, rapidly followed by fat percentage increases. Today, we would say that they overestimated the genetic aspect and underestimated the environmental aspect. However, progress was neverthe-

less achieved. Some yield results from the 13 herds included in the Society in 1895 illustrate the trend (table 3):

It is noted for each year that all of the cows are of the Red Danish Dairy breed. This largely applies to the neighbouring societies, too. However, in 1910 and '12 the first Jersey herds are encountered, but they are nevertheless left out in the calculation of average values because of their high fat percentages, i.e. 5.21 and 5.45 respectively. Until about 1920, almost all members do three rounds of milking a day, and from then on more and more members reduce this to two rounds. In 1921, comments on machine milking in the winter period are encountered for the first time.

As appears from the tables above, it was difficult to increase the volume of milk, whereas it was much easier to increase the fat percentage, and the latter was highly emphasized. With our present-day knowledge about heritabilities, that is hardly surprising.

However, there were also sceptics who were afraid of the planned progress through breeding. At the livestock show in Brørup in 1896, the following statement was made, "The future will bring us poorly built individuals with pointed arses if the yield is to be

Tabel 3.

Year	Number of cows	Pounds of milk	% fat	Feed units
1895-1900	307	6,172	3.35	4,307
1900-1905	332	6,437	3.44	4,473
1905-1910	333	6,353	3.53	4,676



the only criterion in the selection of livestock animals".

As early as in 1896, the Milk Recording Society of Vejen and Environs embarked upon keeping records of pig and horse herds and crops produced in the fields, so they had a record that was more or less comparable with our present-day contribution accounts. This also explains why they kept the society very small with about 300 cows and as few as 11 members. Around 1910, the comprehensive book-keeping of other branches of production peters out, and only the following three areas are retained:

- Recording of yield, kg milk and fat percentage.
- Recording of the consumption of the individual types of feed.
- Registration of hereditary relations, matings and calvings.

Only in the 1950's do the feed records cease to be a mandatory element of the work performed in the milk recording society. It had become pointless. The milk recorder calculated the feed requirements of the animals and often simply recorded, without consulting the herd owner, a roughage and concentrate consumption that corresponded to the requirements of the animals.

#### **Financing.**

As mentioned above, the work of the milk recording society was financed by the members' pay-

ment of a fee per fat percentage determination. However, in the very first financial year of the Milk Recording Society of Vejen and Environs the accounts include a "Grant from the State" of DKK 250. Compared with the total charges of the society of DKK 714, that is a very substantial contribution. In the following years up to 1905, the grant from the State increased to DKK 450 - 500, and the total charges were typically of the order of DKK 1,000. In the following years up to 1920, the grant from the State is reduced to DKK 160 - 190 a year. In the subsequent 15 years the grant is further reduced until it reaches DKK 75 in 1935. From then on, the milk recording societies have user payment only, charged as a fee per fat percentage determination throughout these years. In the first years the fee per fat determination was about DKK 0.05, and in the 1930's the fee increased to approx. DKK 0.20.

#### **Joint management.**

In 1899, the Joint Management of the Cattle Husbandry Associations and Milk Recording Societies in the Kolding District was established. As in other parts of the country, the joint management grew out of the cooperation of farmers' associations, cattle breeding societies and milk recording societies. The district included the eastern part of Ribe County and the southern part of Vejle County. The object was to coordinate the work of the cattle breeding societies and milk recording societies within the district.

An adviser was hired, and it was his job to assist the societies with professional advice on cattle breeding, record keeping, etc. It was also the adviser's job to prepare reports on the results achieved within the field of animal husbandry. All the way up to the 1960's the milk recording societies operated according to this model which was created 50 years earlier. However, some changes were introduced. Most importantly, B-recording and C-recording were accepted to a greater and greater extent so that the number of herds and the number of cows per milk recorder could be increased. The laboratories which had been established gradually took over the work of doing Gerber's Test.

In the course of the 1960, the modern electronic data processing was introduced. Large volumes of routinely figure handling operations are highly suitable for this technology. In actual fact, the figure handling operations of the milk recording societies was the basis for founding the Agricultural EDP Centre (LEC) in Aarhus. All these new developments gradually led to a complete restructuring of the work of the milk recording societies.

A meeting was held in the Kolding District on April 13th 1971 with the aim of uniting all milk recording societies under the Joint Management in one society. The result of the meeting was that the founding general meeting of the new society, which was named the "Milk Recording Society of the Kolding District", was held on June 15th of the same ye-



ar. 13 societies joined the new society from the start. The other societies within the district joined by and by, and the last society joined on October 1st 1986. That marked the end of the era of the Milk Recording Society of Vejen and Environs.

On October 1st 1975, another era in the work of the milk recording society came to an end. The milk recorders stopped doing the Gerber's Test on site. After that date, the fat determination was carried out by means of a milcote-ster at a joint laboratory. The milk recording societies in the Kolding district joined forces with the West Jutland Milk Recording Society and established a private laboratory in Varde. At the laboratories it was also possible to determine the protein content of the milk, and this measurement was introduced in October 1978. Since October of 1989, the cell count of each individual cow has been measured. The current increase in the adherence to the milk recording society work is precisely due to the fact that the milk producers, as members of a milk recording society, obtain information about the cell count of the individual cows, which greatly facilitates controlling the milk quality through culling of cows with high cell counts.

The table below illustrates the course of events in the Milk Recording Society of the Kolding District. Yield figures are influenced by the development of breeds. Until 1950, at least 95 per cent of the cows were of the Red Danish Dairy Breed (RDM), approximately

2 per cent were Jersey, and an even smaller proportion was of the Black and White Danish Dairy Breed (SDM). In 1995, these proportions have totally changed here as well as everywhere else: 14 per cent RDM, 62 per cent SDM, and 17 per cent Jersey.

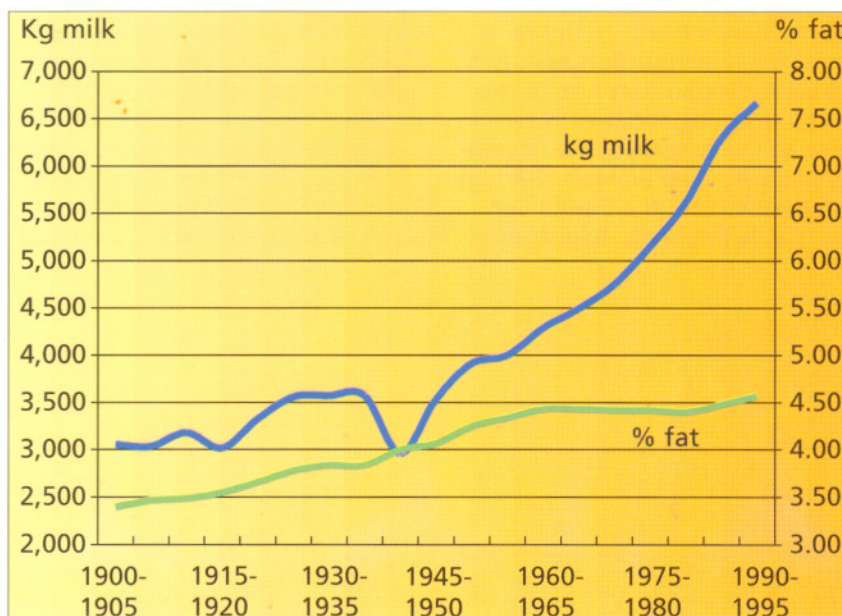
**Importance of the work performed by milk recording societies.**

The most long-term importance of the work performed by the milk recording societies has been to form the basis for the breeding work. Since the 1890's, milk recording and cattle breeding have thus been closely associated. The milk recording societies register

and record the yield of the individual cows, register their pedigree and keep the information up to date. They did so in 1895, and the work performed in 1995 has exactly the same overall target.

The cattle herd books from the 1890's hold a host of information on the animals, with the main emphasis on prizes won at livestock shows. Information on the yield of the cows is very scarce. The yield is registered first and foremost by describing the yield characteristics of the cows, i.e. the shape and size of the escutcheon, the development of the milk veins, etc. It is difficult for us to believe today that breeding according to these criteria could generate any progress!

Figure 6. Yield in the Kolding District, 1900-1995





In the herd books up to 1910, the cows listed in them have in most cases information on yield in the form of pounds of milk per year, average fat percentage, and pounds of butter. The breeding objective was a greater butter yield. It seems that there was a blind faith in what we now call genetic correlation. Most bull dams had fat percentages far above the herd average, and a very large number of elite bulls came from herds with high average fat percentages. The Red Danish Dairy Breed used several hundred bulls from the Hellerup estate on Funen which had fat percentages as high as 4.

Milk recording has to some extent had to adapt to the needs of the cattle breeders. Breeding programmes require certain measures to be taken, for example that the animals have an unambiguous identification mark. In this respect the milk recorders have had to act as the auxiliary arm of the cattle breeding societies in convincing the farmers of the necessity of giving their animals CKR tags (CKR is short for the Danish Central Cattle Register). Registration

of calving ease, calf size, etc. is another example of what the cattle breeding societies require from the work of the milk recording societies. This type of information is not of immediate interest to the individual farmer, but it is necessary for achieving the overall objective as a whole.

#### ***Influence on local policy.***

It should be mentioned as a curiosity that the milk recording societies have had great influence on local policy. The agricultural schools, and naturally Ladelund, too, trained the milk recorders in special one-month courses, often held as an extension to the ordinary five-month winter courses. The trainees acquired great routine in using their pens for book-keeping and handling figures. The newly trained milk recorders took employment for a year or two with a milk recording society and came into close contact with the members and the local population. When they eventually set up shop for themselves, they were generally reputed as people who had a way with figures and letters. They were elected chairmen

of gymnastics clubs, for example, became members of the parish council, managers of the local savings bank branch, directors of the cooperative dairy, and much more. Even today we can find mayors who have their original background in the parish milk recording society.

#### ***Summary.***

The work initiated in 1895 by Niels Pedersen and Søren Peder Knudsen together with the other forward-looking men in the Vejen area is still being continued today, 100 years later. The end from 1895 of creating a better and financially more efficient cow is the same in 1995. The means of attaining the end are more sophisticated nowadays, but the principles of carrying out solid and thorough registration within the herds remain entirely the same. The milk recording societies and the milk recorders still form the basis for cattle breeding work in Denmark. ■







# Milk recorder training through 100 years

by Bent Jensen, principal, Vejlbj Agri-cultural School

It was no coincidence that it was in the Vejen area the first milk recording securely in Denmark and in the world was started in 1895.

The community was solidly anchored, popularly and professionally, in Askov Folk High School, Ladelund Agricultural School, and the Askov Experimental Station, for example.

There is a straight line from the folk high school movement to the establishment of cooperative dairies and agricultural organizations or, as it has been very appropriately expressed, "there have been old folk high school pupils who shone like torches over their parishes and communities throughout their lives" (1).

The Vejen area was such a professional and popular power centre. Emil Konradi, who was trained as a dairy technician and later became a teacher at the Ladelund Agricultural School, became the first milk recorder of the Milk Recording Society of Vejen and Environs.

Quite a lot was required of the milk recorders. That clearly appears from the objects clause that applied for many years to the work performed by the milk recording societies.

"The object of the milk recording society is, through regular examinations of milk volume, milk fatness and the feeding of the individual cows in the herd, to eluci-

date and improve the financial aspects of cattle husbandry, and, by making records of births, pedigree and marking of cows and calves, to contribute to progress through breeding". (2)

## **Milk recorder training until ca. 1965**

The importance of the milk recorder in the distribution of agronomical information should not be underestimated. Until the middle of the 1960's when computers took over many of the milk recorder's functions, he was the person who provided the link between theory and practice through his direct contact with the cattle farmers.

Although exceptions rather than the rule, there are examples of milk recorders who served practically as advisers, even within fields that were not directly related to their field of work, e.g. book-keeping.

Obviously, the very first milk recorders did not have a milk recorder graduation diploma. In addition to an ordinary training course at an agricultural school, they were specially trained in the use of Gerber's fat determination equipment.

The rapid spreading of the idea of milk recording societies - a mere ten years after the foundation of the Milk Recording Society of Vejen and Environs, there were some 300 milk recording societies across the country - made the introduction of a special milk recorder training programme necessary. From about the turn of the century many agricultural schools

started training milk recorders. However, conflicting ideas regarding the requirements for the training of the milk recorders soon emerged.

At the annual meeting of agricultural schools in 1902 the subject was discussed.

It was stated at the meeting that there was "a sad lack of cooperation between the schools, and examples of milk recorders who were unable to handle figures" (3). The meeting decided that only pupils who had completed a five-month course at an agricultural school should be admitted into the milk recorder course.

However, the decision fell to the ground because two schools which were not present at the meeting would not adopt it. It was characteristic that the requirements for the training of the milk recorders were subject to dispute. Some schools offered the training in short specialized courses of one or two months' duration, whereas others maintained that the training as a milk recorder had to be a supplement to a training course at an agricultural school.

The education at the milk recording course included subjects such as book-keeping, sampling and Gerber's Test, writing of pedigree certificates, herd books, and feed planning. At the end of the course a test was held, and marks were given for the following subjects: proficiency in arithmetic, sampling and Gerber's Test, general milk recording theory, neatness of written work, and feed planning.



In addition to the five marks, one of the following class distinctions was entered on the diploma: very highly qualified, highly qualified, or qualified, which was the school's characterization of the pupils' qualifications as milk recorders.

In addition to the professional requirements of the milk recorder, it was important that he possessed personal qualities or such "characteristics that he could reliably and accurately carry out the duties entrusted to him, since the entire purpose and applicability of the numerical information obtained through the milk recording societies fully depends on that". (2)

In the period 1930-1960 a very large number of milk recorders was trained. In the mid-1940's the record shows that some 40-45 courses were held every year at 30-35 schools with a total number of pupils of approximately 800. (2)

#### ***Milk recorder training since 1965***

Until the mid-1960's, the milk recorders were trained largely as described above. The introduction of EDP was no less than a revolution in the work of the milk recorder. In a matter of a few years, the work became so specialized that the broad milk recorder training was no longer required.

When EDP was taking over many of the milk recorder's functions, the societies amalgamated, and a large number of milk recorders became redundant.

As a result of these developments, the agricultural schools stopped training milk recorders as from the mid-1960's.

After a period of several years without training of milk recorders, the need for training a small number milk recorders arose in the late 1970's.

This task was entrusted to Vejlbj Agricultural School. The six-week course was held by the school in cooperation with the National Department of Cattle Husbandry and the Agricultural EDP Centre (LEC).

The subjects included in the training programme were test recording, milk analysis and sampling, technique, test theory and cattle breeding, feeding theory and efficiency inspection. In addition, a mark was given for the neatness of written work.

In the late 1960's, many societies started hiring samplers without any formal training. A few of the samplers were later given permanent employment as milk recorders and have supplemented their skills through in-service training.

In 1967, the agro-technician training programme was started at Vejlbj Agricultural School. The milk recording examination was included in the programme for agro-technicians specializing in animal husbandry. Today, the agro-technician programme takes two years, and it is an advanced supplement to the farmer training programme.

The programme does not comprise any direct "milk recording subjects" but it does include advanced training in the subjects which are necessary for providing up-to-date services to the cattle farming sector within fields such

as production analysis, production economy, cattle feeding, etc.

#### ***In-service training of milk recorders***

The illustration of the training of milk recorders should justly include a description of their in-service training.

Until about 1960, the in-service training of the milk recorders mainly took place under the auspices of the Joint Managements in the form of milk recorder meetings in which the local and regional advisers acted as teachers.

When the National Department of Cattle Husbandry had been established, the in-service training was planned at the national level in cooperation with the trade organization of the milk recorders.

For a number of years two-day in-service training courses were held at Bygholm Agricultural School. In recent years the courses have been held at Vejlbj Agricultural School.

Reporting procedures and handling of computerized aids have been permanent items on the agenda for these in-service training courses.

The courses are attended by a very large number of participants, and they also play an important role in strengthening the collegiate and social relations between the milk recorders.

#### ***Conclusion***

The story of the development of Danish cattle husbandry in the 20th century is also the story of the work of the milk recording



societies and the milk recorders.

Although it has at times been difficult to achieve total agreement on the position of the milk recorders in the cattle farming service system, it is indisputable that the milk recorders have played an important role.

The cattle farming sector of today and tomorrow will redefine the requirements for service staff training. After a period of heavy specialization within the service functions of cattle farming, we are now once again approaching the requirement for versatility with the object of becoming able to provide services to the cattle farmers within several fields - just as the case was in the first milk recording societies.

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# The major changes in the milk recording system

by Arne Nielsen, national adviser

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The introduction of EDP for processing the large volumes of data from the milk recording system, the introduction of central laboratories, and the decentralization of the input and correction work each constituted a major change in the daily milk recording routine.

They all entailed substantial rationalization and gained great importance because they permitted milk recording to be offered to milk recording society members at a very cheap price as compared with our neighbouring countries. At the same time we have gradually achieved a quality standard and, via the Cattle Data Base, a mutual connection with other agricultural service facilities that is without equal in any other country. Moreover, these changes

entailed major alterations in the daily routines of the milk recorders; they also did entail a reduction in the number of milk recorders, yet at the same time it became possible to make a living as a milk recorder. In addition, both the milk recorders and the members were relieved of the inconvenience and unpleasantness that were also associated with changing "address" every day. ■

*These three major changes will be described in the following three sections.*



# The transition from manually to computer processed milk recording data

by Peter Axelsen, adviser, formerly milk recorder

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Once upon a time (that is how all good stories begin), before we reached our present computer age, the milk recorders lived on and took part in the life on the farms, inside as well as outside. The milk recorders bicycled around from farm to farm, and the farmers transported the milk recording equipment to the next farm on the circuit by horse and carriage. A bed had to be made for the milk recorder, often in a cold and dank room, or on a sofa in a hot smoke-filled living room in which we had played cards all night long, as was the habit at that time.

I remember a farmer who explained to me the first time I was hired as a milk recorder that there were two factors that were essential to handling the job as a milk recorder. First of all you had to be able to get along with the women on the farm, because you usually had to sit at the dinner table with your records. Secondly, you had to know how to play cards, because playing cards was common practice when the milk recorder visited the farm. Of course, it was great if you could do the accounts, but a milk recorder that the women could count on was always sure of being hired again!

When I got tired of riding my bike, I bought a motorcycle with a side-car that could just hold the centrifuge, buckets, glasses and

the other equipment. I then tried to agree with the society on a piece rate concerning transport of my gear but that was out of the question because it would entail an increase in the annual membership fee per cow from six to seven kroner. Consequently, I was allowed to make arrangements with the individual farmers. Financially, that was a better deal for me, and the farmers thought it was cheap. They were happy that they did not have to drive the Gerber box around any more. There were only two farmers who did not accept the scheme plus one who would join only if I would play cards. After all, that would give him a chance of winning back his money. Anyway, I made it with regard to the women and the cards as well as with regard to the accounts.

## **Amalgamation into bigger societies**

The following year I was offered to participate in the experiment of forming a big society with some 4,000 cows. Fat determination was then to be carried out at a dairy, and the records were to be kept at an office set up for that very purpose. The experiment was never implemented because the farmers were afraid of dissemination of infections!

Instead the experiment was relocated to the Aarhus region where a society with some 3,000 cows was formed. Premises were rented for office space and doing Gerber's Test. The place had hot water and heating so that was a great improvement. Three milk

recorders were hired, and they had their permanent address there. One milk recorder should keep the records, the other two should take care of the field work and Gerber's Test, perhaps with assistance from samplers, and ledgers should be drawn up for all herds.

The adviser, the boards and we milk recorders discussed at great length the advantages and disadvantages of such an undertaking.

We milk recorders were very happy about the prospects of a fixed domicile, and perhaps the work could become a job from which we could make a living. We also found the premises with hot water and a heated room for doing the Gerber's Test very appealing. All parties agreed that the ledger was a good idea. With the pedigree entered correctly once and for all and an annual update of yield and calvings, all the information was kept on one sheet per cow.

The recorders working in the field might find more time for preparing feeding plans, making single-day feed inspections, adjusting milking machines, and advising on better hygiene that could lead to a better milk quality. Moreover, we might be able to provide assistance in selecting the right bulls for the right cows.

The farmers, of course, no longer had to transport the milk recording equipment and make beds for the milk recorders but, alas, things did not turn out as well as expected. One milk recorder had a fall with his motorcycle, spilled all his samples and broke



his leg. Another one had to go into hospital with a bleeding ulcer. Worst of all, however, was that the milk recorder who had to keep the records gave up and cleared out, but fortunately he did not abandon his cows; he continued as a milk recorder in the old-fashioned way in the society he originally came from. So we had to accept that Murphy's Law, which states that if something can go wrong it will, was in force even back then!

#### ***The first experiment with EDP***

The experiment was then extended with an agreement with the Punched-Card Centres of the Dairies and the Slaughterhouses, later to become the Agricultural EDP Centre, to the effect that they should keep the records. Only few societies were party to this first agreement on using EDP in the milk recording system. The agreement came into effect on October 1st, 1956.

The start was rough, probably because it happened so suddenly without any thorough analysis or planning in advance. The start was an imitation of the old system, both with regard to reporting and the print-outs. We milk recorders were in favour of the system, because we escaped innumerable table readings and writing down a lot of figures. At the same time we escaped the extreme work load in the period when the annual statements had to be prepared. What also appealed to us were the prospects of having special statements prepared quickly, e.g. short-term state-

ments, disease statements, and twin births, covering all animals, etc., etc.

Perhaps the start was also rough because the initiative was taken by a few milk recording societies without the National Committee of Danish Milk Recording Societies participating in the planning process initially. However, the Committee joined in shortly afterwards. Work groups were then set up; they had to prepare proposals for improvement of all work carried out by the milk recording societies.

In March of 1956 I was then employed by the Punched-Card Centres of the Dairies and the Slaughterhouses in order to assist in drawing up and keeping proper milk recording accounts etc.

More milk recording societies joined rapidly. The number of cows increased from 4,000 to 110,000 in only 2<sup>o</sup> years.

While modernizing the accounts, we ran into problems finding the time to register the rapidly increasing volume of data. We employed about 30 people to keyboard the information, and at the same time we contracted with many of the slaughterhouses whose settlements we handled, and who had surplus punching capacity, to punch the milk recording information. It worked in the way that we forwarded a number of grams of test milking sheets that corresponded to the number of cards they had promised to punch.

All this punching was later replaced by optically readable print. I had the pleasure of travelling

around the country to teach the milk recorders to print figures that were optically readable. The milk recorders, who were certainly used to writing figures, made a little fuss about that, but they soon taught their wives to print those figures so everything was all right.

In the beginning the milk recorders had to calculate feeding and milking days. Since it was hard to always make the number of days tally with the number of days in the year, the machine was given the added feature of calculating the number of days on the basis of the test dates as well as various calving, empty, admission and dismissal dates. And I have to admit that although milk recorders are clever people, the machine was more reliable when it came to hitting the accurate number of days right on the nose, even in leap years.

A lot of good work was done by the committees that were set up to further develop the records and keep them up to date so that they met the needs of the farmers. Consequently, changes and improvements were introduced regularly. As a result, it was my pleasant job for a number of years to inform milk recorders and advisers about new discoveries. That was very inspiring, because if something was not good enough in the opinion of the milk recorders and advisers, they always dropped a hint to that effect.

The farmers kicked up a fuss every time the records were changed. Variety is not always the spice of life although the change is



for the better. However, with a little explanation and a little habituation the changes were always accepted.

Many problems arose and were solved over the years, and it was 40 eventful years for me.

Those who are familiar with the milk recording accounts of today will see that the fantasies we had 40 years ago were not nearly wild enough. Today, the accounts are made up in such a way that each individual farmer can have the exact information he feels he needs while at the same time having basic data on the breeding work at his disposal.

It is really incredible how much can be deduced from the information generated from the data collected by the milk recorders for the benefit of each individual farmer, Danish cattle breeding, and cattle husbandry in general. ■



# Centralized laboratory activities

by Arne Nielsen, national adviser

As early as in the late 1950's ideas were emerging on the island of Bornholm about rationalizing the work performed by the milk recording societies; especially to carry out fat determinations on a much larger scale than that practised in other parts of the country (1). At that time the island had 26 milk recording societies, each with its own milk recorder. The ideas were focused on having the fat determinations carried out jointly and at the same time switching over to using samplers. They reckoned that this would permit the number of milk recorders proper to be reduced to five.

Strangely enough, the Nordic Dairy Journal, No. 7, 1958, was issued with a series of articles on the advantages of setting up central laboratories all over Denmark. These ideas met with so much sympathy on Bornholm that the people there decided to study the matter carefully before making a final decision.

The proposal was to set up central laboratories for every 40-50 dairies and milk recording societies in the area. In 1957/58 there were 1,721 milk recording societies in Denmark!

The reason for the proposal about central laboratories was that the time was found to be ripe for ensuring that only hygienically irreproachable milk was produced in Denmark. It was stated in one report (1) that "There must

at no time at all have been too many bacteria in the milk, and it is both aesthetically and sanitarily inadmissible to produce dairy products from milk that contained mastitis producing bacteria at the time of milking, or that an excess of colibacilli is added to the milk due to unhygienic milking or poor storage of the milk".

It was further pointed out (1) that the problem of hygiene was only one of several problems that needed to be solved. For example, the following matters were mentioned: Inspection that bactericidal disinfectants had not been added to the milk, or that it contained residual concentrations of antibiotics. Mastitis inspection was required on a continuous basis. Central Gerber's Test taking. Protein determination. Hygienic/bacteriological inspection of the operation of the associated dairies. Registration and statistical processing of all results obtained, etc.

Looking at all of these problems today, they were very relevant, and some of them were solved only much later.

The idea of the central laboratory sketched in this description and with all the tasks mentioned was an original Danish idea. However, some of the problems mentioned were already being solved in Germany and the Netherlands. For example, central taking of Gerber's Test had been carried out in Germany for about 30 years, and mass protein determination had long been routine in the Netherlands.

## Study trip 1958

A study trip to Germany (the milk recording society for Schleswig-Holstein in Kiel) and the Netherlands was made in October 1958. In the Netherlands the main focus was on studying mass protein determination. The participants were representatives of the National Committee of Danish Milk Recording Societies, the Joint Purchasing Organization of the Danish Dairies, the Architect Office of the Danish Dairies, the Joint Association of Milk Recording Societies on Bornholm, and the Mastitis Laboratories.

The conclusion from the study trip (1) was that the Gerber's Test centres which had been visited were so simple in principle and in layout that there could be neither financial nor other major obstacles to establishing something similar in Denmark.

## Central fat determination established on Bornholm

The concrete result of the deliberations on Bornholm in the summer of 1958 and of the study trip mentioned above was an agreement between the Joint Association of Milk Recording Societies on Bornholm and Bornholm's Co-operative Dairy on the establishment of a central laboratory which should carry out fat determination for both parties, for example. The dairy undertook to pay the costs - and that is the way it has been on Bornholm ever since!

The central laboratory worked well and to everybody's satisfaction. All milk recording societies



joined up from the beginning even though they were not all equally enthusiastic.

This central laboratory thus became the first one of its kind within the Danish milk recording societies, and it remained in operation until the transition was made to the more advanced Foss-Electric equipment, at which point the analysis work was transferred to Ringsted on Zealand.

However, the central laboratory on Bornholm became the forerunner of the central laboratories employed today, so the idea was actually conceived at a quite early stage. ■

*Source: (1) Report on Centralized Laboratory Activities  
Published by the Joint Purchasing Organization of the Danish Dairies A.m.b.a., December 1958.*



# Establishment of the TP stations

by Povl Solmer Frank, Vojens, adviser

On 16 August 1977, a group of nine people met with the object of assessing the possibilities of further automation/rationalization in connection with the collection of data from the milk recording system. The nine included representatives of the milk recording societies, LEC (the Agricultural EDP Centre), IBM, and Foss Electric from Hillerød.

The day started off with a visit to the laboratory of the Southern Jutland Milk Recording Society in Ørsted near Jels where fat and protein determination (about 4,000 tests a day) from 85,000 cows in 3,500 herds had been carried out since the autumn of 1970. The next item on the agenda was a three-hour meeting in which all known know-how about data collection and transmission was presented. The spectrum of the issues was far-reaching: bottle registration equipment, electronic milking meters, cow identification systems, and, not least, automation of all links in the data chain of the milk recording system.

The result of the meeting was a general consensus on recognising the possibilities at the technical level, and thus that the comprehensive daily data volumes constituted a basis for embarking upon the project of developing and preparing technical systems which could solve the problem at hand.

The advantages were obvious. The laborious and trivial work of printing optically readable figures could be completely abandoned. At the same time the handling time, from the date of the test milking till the farmer received the computer print-outs, would be cut in half to about four or five days.

After about two years' preparations at several levels, the project had reached the point where the starting signal could be given. Naturally, implementation of the project was considered to be an experiment. It was decided to start in two different locations. Partly on Bornholm (November 1979) and partly in Southern Jutland (April 1980).

In February-March 1980, a committee was set up on the initiative of the National Committee on Danish Cattle Husbandry. Its task was to elucidate the future technological potential of test milking equipment, laboratory equipment, and the use of data transmission. A subsequent report (May 1980) clearly documented that the two experiments initiated were pointing to the future.

In Southern Jutland there was the problem, which was due to other reasons, that they had to establish new premises. In January of 1980 a new laboratory was inaugurated, and in April 1980, as mentioned above, the TP function was commissioned. (TP stations is the name in colloquial usage for TeleProcessing stations, i.e. the interconnected (on-line) offices that input data from the milk recording system, etc.)

As is the case with all new things, there were teething troubles, and most of them of a technical nature. However, with gentle patience and in some periods a considerable extra work effort - in some cases of extensive duration - the difficult situations were handled. The conversion to new computer print-outs in June of 1980 also caused some problems.

The technical problems were recurring during the first twelve months, but as the machine capacity at LEC was extended and better operating systems for handling the accelerating TP traffic were taken into use, things went more smoothly.

The original expectations from 1977 for faster and more accurate processing of data, eliminations of trivial work, and a substantial reduction of the interval from the test milking date till the computer print-outs were received by the herd owners were gradually fulfilled.

An important precondition for the new procedure was that test milking sheets should be used instead of the illustrious test milking books. Even in the mid-1970's the Southern Jutland Milk Recording Society had started to use test milking sheets, a copy of which was issued to the herd owner, stating the fat and protein percentages. This practice was suspended with the commissioning of the TP station, causing a little dissatisfaction in some quarters because it was perceived as being poorer service. However, this dissatisfaction was gradually



silenced when it became clear that the print-outs were received much faster than before. Whereas there was previously an average interval of 7-8 days before reception of the print-outs, this was now reduced by 4-5 days, and in some cases even more.

Of course, the transition to the new system required substantial investment but advance calculations showed that the financial scales could be balanced, and that held true. A very strict cost control effort made this possible, although in terms of capacity the

equipment acquired could have handled considerably larger data volumes in Southern Jutland.

In June 1981 the National Committee on Danish Cattle Husbandry could announce that it found, based on the experience gained (Bornholm and Southern Jutland), that TP input was applicable in the milk recording work under a number of given conditions. Besides the shorter interval between test milking and reception of the print-outs, one of the other great advantages of the system was that the responsibility for correcting

errors was also decentralized, which also resulted in higher quality.

In the course of the following years an ever greater volume of data was transferred via TP. In mid-1984, the transition had been implemented throughout the country.

A seven-year phase of development and establishment had come to an end. With the new tool operating, innumerable possibilities of providing further services to cattle farming had been opened. ■



# The milk recording system as the basis for the cattle data base

By Ole Klejs Hansen, head of department, National Department of Cattle Husbandry

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Animal farmers have always wanted to improve the quality of their animals. This goal has been pursued within individual herds for thousands of years but an impartial public evaluation across herd lines only started with the livestock shows in the beginning of the 19th century (Randers in 1810, Vejle in 1824, Maribo in 1831). Conformation and meat distribution were important traits in cattle farming at that time when the main aim was meat production.

From the middle of the 19th century, milk production gained increasing importance. In the 1870's several new pieces of equipment were designed which were able to determine the "cream content" of the milk. However, they were difficult to use, and the break-through only came with doctor Gerber's apparatus which was tested by the Experimental Laboratory in 1893. The first cooperative dairy was established in Hjedding in 1882. At the same time the keeping of herd books on cattle was started in Denmark - the first official herd book was published in 1881, and the first cattle breeding societies (bull-keeping societies) were formed in 1884.

The milk recording societies systematized milk recording. The object was described as follows in

the articles of association of the Milk Recording Society of Vejen and Environs:

"The object of the Society is to establish strains of cows that produce large quantities of fat milk".

This object contained two aspects, one related to breeding and one related to production. The cattle farmer can now pick out high-yielding cows (milk fat) for breeding but he also has to learn how to feed them in order to achieve a high yield.

As regarded the work of the milk recorder, the articles read:

"The Board shall hire on behalf of the Society a milk recorder who shall take out and test samples from the milk of each individual cow; for this purpose one Gerber's apparatus shall be purchased. The milk recorder shall also keep precise records of each individual cow's milk, butter yield and feed consumption, and he shall prepare a summary of the hereditary interrelations of all herds and individuals in order to make it possible to pick out animals with breeding values that must be deemed to have a positive and improving effect on breeding in general."

In the Extended Milk Recording Society of Mid-Langeland, which was started by consul A. C. Duborg in 1907, they not only kept records of the cows' yield and feed consumption, the milk recorder kept financial accounts for the entire farm, including both livestock and field production. That was the combination of periodic feed control and contribution accounts of that era.

Systematic registrations from the milk recording system were used as the basis for making calculations across herd lines at a very early stage. The first widely used feeding standards were published by the Swedish professor Niels Hansson in 1902. They were based on a processing of collected information on milk yield and feed consumption from the milk recording system in Sweden. Information from the milk recording system in Denmark formed the basis when professor Lars Frederiksen planned the experiments that led to new Danish feeding standards in 1931. (136th Report from the Experimental Laboratory.) Lars Frederiksen's scientific work led to an adjustment of Niels Hansson's system.

## Feeding instructions

After the issue of Lars Frederiksen's standards, the milk recorders calculated how the individual cows should be fed. Cow yields were converted into 4% fat-corrected milk, and the cows were divided into feed classes. The cattle farmer prepared his feeding plan himself or he selected a standard feeding plan (often from pamphlets issued by the Home Economics Society). In the 1950's the so-called joint managements began employing livestock advisers who also had to assist in the preparation of feeding plans. In the course of the 1960's the local farmers' unions and family farmers' associations began to employ their own feeding advisers who gradually took over this work.



In 1972, it became possible to send in a basic feeding plan whereupon a computer calculation was made after each milk recording of the amount of feed that should be allocated to each cow. The results were printed out on so-called "feeding slips" that could be attached to the farmer's own barn sheets. At one end of the slip was stated the cow's number, milk volume and fat percentage at the last milk recording, and at the other end either the feeding class or the allocation of concentrate (complete volumes) and roughage (only in connection with reduced volumes). Lars Frederiksen's standards were used until 1984 when the new principles of feed allocation (551st Report from the National Institute of Animal Science) were implemented. In the interim period the yield of the cows had increased from 133 to 253 kg fat.

In 1976, an extended feeding programme was put into operation, the so-called KO-OP programme. Based on the information reported on the animals in the herd, the programme could calculate a forecast of animals admitted into or dismissed from the herd, of the milk production, and of the feed requirement three years into the future. This required the presence of information on inseminations, matings and pregnancy tests. Failing this, the average calving interval or the average calving age was used for calculating expected calvings. In the beginning a great deal of information from the AI societies was missing or it was much delayed. Today,

the basic data required from 1,500,000 inseminations and 700,000 pregnancy tests etc. is transferred electronically from the AI technician's portable terminal through the pc of the AI society to the Cattle Data Base.

In 1984, a new system for calculating feeding was implemented with the introduction of the so-called strategic feeding, which meant that in the first months after calving all cows in the herd were allocated the same volume of concentrate and as much roughage as they could eat. The feeding classes were abandoned, because it had been established that the feed conversion dropped as the feed allocation was increased, and also because it became desirable to use the cows' fatness as a feeding objective. The system prints out the feed to be allocated to each individual cow on lists or sheets. If the farmer has not handed in a feeding plan, the system prints out the number of feed units the cow should be allocated.

### **Dairies**

As early as in 1906-07, the milk volume from the dairy was voluntarily printed together with the figures of the milk recording system in the annual reports for Funen and Zealand. This became mandatory in 1911. The people on the island of Funen were first to introduce mandatory printing of the fat percentage from the dairy. They did so in 1923. This became the general practice in all milk recording societies throughout the country very soon after-

wards. After the introduction of computerized accounts for the milk recording system and computerized settlement for the milk to the farmer, electronic data transfer was established from the dairies to the Cattle Data Base of the milk recording system.

Deviations between milk recording societies and dairies have given rise to much debate over the years. There may be many reasons for deviations in milk volume: large retention of milk for calves, as a consequence of udder disease or due to quota problems, erroneous operation of milk meters, deviating testing periods, cows outside the milk recording system, etc. Deviations in the fat percentage may be due to a lack of agitation in the milk tank, erroneous operation of milk meters (milk recording and tank lorry), error in the sampling equipment of tank lorries, etc.

As from 1978, data was transferred from the dairies every month, and fixed limits for deviations in respect of milk volume and fat percentage were built into the system so that any herds with problems could be pointed out automatically. If the deviations are excessive, the local milk recording society has to determine whether or not the cattle farmer has a satisfactory explanation. Otherwise the accounts will be transferred to unofficial status.

The milk quality advisers of the dairies use the cell count analyses of the milk recording system in their work in herds with problems, and the milk recording system is given information on the



taking of individual glandular samples, which are printed out on the cell count statement.

### **Slaughterhouses**

With the introduction of the CKR number (see below) it became possible to link data from the slaughterhouses to the Cattle Data Base. Transfer of data was initiated in the 1980's, and the data base is now receiving data on 700,000 slaughtering annually. The data includes the time of slaughtering, category (calf, young bull, young cow, etc.), slaughter weight, and classification. We are currently developing facilities for registering additional comments on the slaughtering, as had been the practice in the slaughtering of pigs for many years.

This information is very important in checking the course of production within the herd. Is the growth rate of the calves for slaughter sufficiently high? Have the cows culled been fattened satisfactorily before being slaughtered? Are there any problems with liver flukes and liver abscesses? The information has also demonstrated so great correspondence with the results achieved by the sires during performance testing that it can be used in the breeding work, too.

### **Health advice**

Collection of data on disease treatment, hoof trimming, etc. has got well under way during the past decade. The Cattle Data Base receives information from Veterinary Data or via barn register charts. Information on some

700,000 treatments is received annually at present. The collected data is used in the health advice given to the individual cattle farmers (management lists and key ratio print-out) but can also be incorporated in the calculation of indices for health traits (e.g. mastitis resistance).

The data base has proved itself valuable in checking for hereditary deformities, and it is now also being used in connection with infectious diseases such as BVD, and the cattle farmer can obtain lists of the status of the individual animals based on blood testing and pedigree.

### **Identification**

The identification of an animal was initially based on its appearance. This system is also used today within the speckled cattle breeds - even in highly developed countries (drawing or photo of animal). Systems such as branding of the skin or horns, notching of the edge of ears and tattooing were gradually introduced. Metal ear tags were also used at the beginning of the 20th century. In Denmark the most common was to use aluminium tags with embossed serial number, year of birth, and the numbers of the father and mother.

Around 1915, the AI and milk recording societies agreed on using a common ear-notching system. The calves had their mother's number notched into their ears, and when a heifer had calved, her number as a cow was burned into her horns. As dehorning became more common it was

only possible to resort to the original ear notching (mother's number). Today, the animals have their own numbers from birth, and that is the number we notch now. Apart from that, the ear notching system is the same as that adopted 80 years ago.

A common feature of the systems mentioned above is that they could not be used across herd lines. Ear notching "15" does not say where the animal comes from. The complete identity of the animal actually had to include the number of the milk recording society, the farmer's membership number in the milk recording society, and the animal's cow number.

To achieve an unambiguous identification of cattle, the National Department of Cattle Husbandry introduced the Central Cattle Register, colloquially called the CKR register, in 1982.

The system comprises two elements, namely a farm number and an animal number. The farm number has five digits and is linked to the address of the farm. If the owner moves, the number remains with the farm. It is thus an unambiguous number for the farm in question. The farm number is independent of the county, municipality, milk recording society, etc. The animal number has four digits, permitting the farm to have up to 9,999 different animal numbers. In 1982, this meant that an average herd could propagate itself for almost 200 years before it would be necessary to start over from the beginning. However, we have to anticipate that some herds will already hit the ceiling



around the year 2000.

In 1982, the rule was introduced that all animals included in the milk recording system should carry a metal ear tag on which the animal's number should be embossed. However, the metal ear tag became unpopular, first and foremost because it could not be read from a distance. In 1990 the switch was then made to yellow plastic ear tags on which the animal number is embossed with large print (25 x 5 mm) so that it can be read from a distance of several metres.

In 1993, the Danish Ministry of Agriculture introduced an unambiguous system for marking and registration of livestock in Denmark. Negotiations with the agricultural organizations resulted in an agreement on the Ministry of Agriculture taking over the system as the official Danish marking system. The Ministry of Agriculture's register is called the Central Livestock Register, colloquially called the CHR register. It is always kept up to date, partly through the CKR register. This is where farm numbers and herd numbers are allocated, and where ear tags for cattle, sheep and goats are numbered.

The CHR register contains information on farms and herds. The CKR register contains information on the individual head of cattle.

#### **Our current position**

Most of the information on his animals naturally used by the cattle farmer today would not be available without the milk recording system and the beef cattle

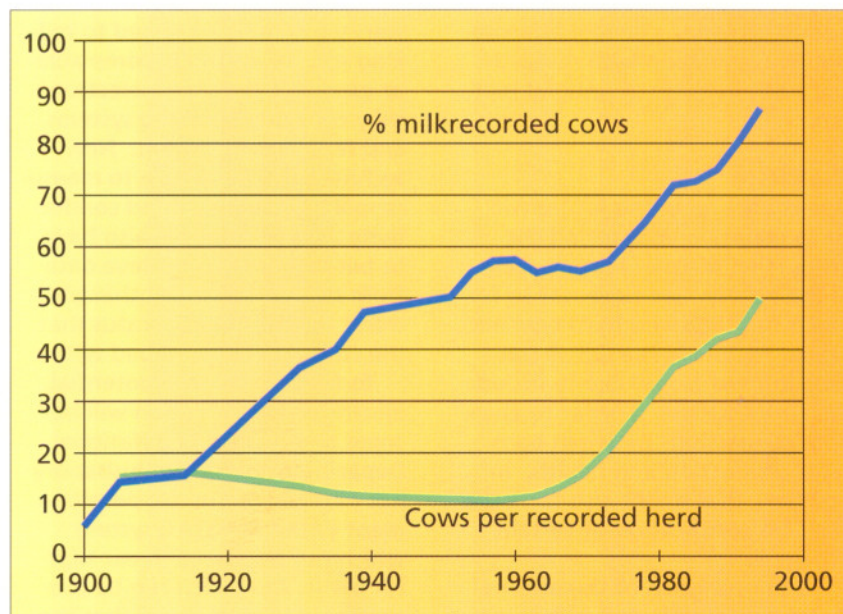


Figure 7. Percentage of recorded cows and herd size are increasing

registration. This applies to both information on day-to-day management of the herd and information on breeding work within the individual breeds.

85% of the Danish dairy cows are included in the milk recording system. The data base contains information on some 2,000,000 live head of cattle and on a total of some 15,000,000 head. Each year 6,600,000 test milking results are reported, 700,000 calvings, 600,000 purchases and sales, results from 6,000,000 milk analyses, 1,500,000 inseminations, 700,000 pregnancy tests etc., and information on 700,000 registered cases of disease. In addition to that comes information on conformation evaluation, flushings, embryo

transplants, hoof trimming, etc.

In connection with the EC's premium scheme for beef, the results from the public milk recording system can be used as evidence that the herd's yield is over 6,150 kg milk. Both the veterinary authorities and the EC directorate acknowledge notes taken during milk recording or beef cattle registration as sufficient evidence, provided, of course, that the information is complete and entered correctly.

The milk recording system formed the basis for the development of the Cattle Data Base, and it thus stands as the pillar of breeding value assessment and production management as far as dairy cattle is concerned. In addi-



tion, it provides valuable information in connection with research and examinations of general matters.

#### **The future**

One challenge in the future will be to maintain and extend the proportion of cows participating in the system. We have not so far had information on barn type and similar factors in the Cattle Data Base but we should like to include such information in order to elucidate connections between barn type, production and health. In addition, that might also form the basis for certification of certain products.

At the congress of the international organization of milk recording societies (ICAR) in 1994, Denmark presented a report which showed, with results from both the comparison with dairy figures and the compulsory repeated testing, that the B-test in Denmark is just as reliable as the A-test. The report is based not only on results from Denmark, but data from the other Scandinavian countries and the Netherlands has been used for comparison. We have come a long way with regard to making milk recording cheaper but we still have to be alert to new possibilities.

It will be a challenge to exploit and adapt to technological developments of milk testers, analysis equipment, and electronic control systems in the livestock buildings. The milk recording system has to be extended to allow reception and processing of results straight from electronic milk te-

sters which may be linked to milking robots, and to become able to exchange data with electronically controlled milking systems and feeding equipment. New technology will be able to measure milk temperature and conductivity, and perhaps we also have to become able to retrieve data from step counters or other electronic measuring apparatus that the cow may be equipped with.

To fully exploit the potential, electronic identification will become a necessity. The National Department of Cattle Husbandry has participated in the development of the MAGTAG system which can be placed in ear tags for cattle and which can be programmed in such a way that the present identification system can be retained unchanged, only in electronic form.

Denmark, Norway, Sweden and Finland are working on establishing the basis for a joint data base system, meaning that input data is defined and stored identically. A result of that could be that it would only be necessary to develop one data base programme and one data model which could then be used in four copies in each country, or the four countries could have one common data base.

The data base could include both dairy cattle and beef cattle, because all basic information concerning identification, reproduction and health can be registered in the same way, regardless of the purpose of the breed. Only as regards the production objectives is there an obvious need for distin-

guishing between dairy cattle and beef cattle.

Naturally, the output data has to be adapted to the individual countries and breeds. The breeding objectives of one breed are not necessarily identical in different countries, and all the countries have different languages.

The object of this project, which has already attracted interest from other countries, is partly to minimize the development costs per cow but also to change dramatically the possibility of transferring data between bases.

The milk recording system was started 100 years ago but its importance has increased proportionately with the potential for utilizing data material. The milk recording system has to be accurate and dependable, yet at the same time it should be as simple and cheap as possible for the cattle farmer to use. The Danish milk recording system has always been a trail-blazer by international standards. We will continue to be so in future. ■







# The Milk Recording System - Basis of Herdbook-Keeping and Breeding Value Evaluation

By Thorkild Lykke, the Danish National Department for Cattle Husbandry

For most of this century, the milk recording system has served as the foundation on which the herd-book and breeding value systems are based. These two activities seem very diverse, but in reality they represent two aspects of the same matter.

The objective of keeping herd-books has been to record and publish data on the descent of cows and bulls, so that these data could be used as a basis for planning and carrying breeding plans into effect. The breeding value evaluation system is based on pedigree data, and its purpose is to generate concrete data on the breeding value of each individual animal. Today, the breeding values and the pedigree data combine to form the joint basis on which all breeding activities build.

## Historical Perspective

### Herd-Books

Herd-books were introduced in 1881, approx. 15 years prior to the establishment of the milk recording system. The first records were thus based solely on pedigree data and subjective evaluations of the quality of the animals. Later the herd-book system came to be based on pedigree and yield data

obtained via the milk recording system, and this made it far more valuable. The herd-books now contained an objective evaluation of the quality of the animals.

For many years, the fact that a cow or a bull had been found eligible for registration in the herd-book represented a quality mark, which gave them a kind of seal of approval as good breeding animals. Having one's cows entered into the herd-book was considered a point of honour by the individual herd owners, and the herds were divided into breeding-stock and commercial herds. From the '50s and '60s and onwards, quality evaluations were to an increasing extent based on breeding values, and the herd-book thus changed its character and came to be regarded more as a filing system than a quality parameter.

### Breeding Value Evaluation

Prior to the introduction of the milk recording system, the breeding value evaluation system was based on an assessment of the appearance of the animals and their so-called dairy character, but with the introduction of the milk recording system, a basis had been created on which true breeding value evaluations based on concrete measurements could be performed.

### Progeny Tests

The first breeding value evaluations were performed on bulls, as at the beginning of the nineteenth century a large number of bull-keeping societies had been established in Denmark. The bulls of

these societies were used on a lot of cows, and there was a need for a quality evaluation system. The first attempts at such a system were made by means of progeny tests, that consisted in a comparison of the yields of the daughters and the dams. The progress that the daughters of a bull had made in comparison to their dams was considered an expression of the bull's breeding value, but on account of changes in feeding and environmental conditions this method soon turned out to be insufficient.

The introduction of artificial insemination in 1936 generated an interest in fast and efficient methods of determining the breeding value of the individual bull, and in 1945 the dairy cattle progeny tests were established. The National Institute of Animal Science was responsible for carrying out the actual work involved, for which it received subsidies from the Danish Ministry of Agriculture and Fisheries. A progeny test group (20 heifers) was gathered at one testing station, and on average the test period was 304 days. All stations used the same feeding plan. The most important results were the yield figures, but also other types of information such as conformation characters, feed consumption, daily gain and a number of management traits were made available. The extent to which progeny tests were performed, culminated in 1957/58, when there were 102 groups. Average yields rose from 177 kg butterfat in 1945/46 to 262 kg in 1973/74.



Progeny tests had one significant weakness, and this was that it was difficult to create identical conditions at all stations, and in combination with the heavy operation costs, this was the reason why the stations were closed-down in 1974.

#### **P- and R-Values**

A cheaper breeding value evaluation system was initiated in 1962, when the Ministry of Agriculture's Productivity Committee, the Committee on Animal Husbandry began publishing the results of a systematic study of the yields of the daughter groups of bulls - studies which had been performed on the basis of data supplied by the milk recording societies, which had by then computerized the calculation of their milk recording accounts.

During the first few years, these study results were published as the average milk and butterfat yields produced by the daughter groups over a period of 130 or 305 days of the first lactation. In 1964/65 yield correction factors for age and for the yield level of the respective herds were introduced. In order to facilitate evaluation, two new concepts were also introduced - the P-value and the R-value. The P-value was a percentage that described a progeny group's corrected butter fat yield, viz. the yield produced during the first 130 days of the 1st lactation and related to the breed average for butter fat yield. The R-value described the butter fat yield of a progeny group produced over a period of 305 days - and again this figure was seen in relation to

a breed average of all 1st lactation cows of the same age and with the same herd yield level. For all breeds, the average value of the R-value was thus fixed at about 100.

In regard to bulls, 1971/72 saw the introduction of a correction factor for calving month, so that the yields of different daughter groups, where the individual daughters calved in different seasons, could be correctly compared. At that time, the National Institute of Animal Science also developed a Y-value, which described the predicted breeding value of cows in respect of their 1st lactation butterfat yield. The milk recording societies adopted the Y-value in 1975.

In 1980, the R-value was converted into a breeding value, and a new method was developed which incorporated the predicted yields of daughters with incomplete lactations. This made it possible to calculate the R-value somewhat earlier, and it rendered superfluous the P-value, which was abolished.

#### **Protein and Breeding Activities**

In 1985, a systematic registration of the protein content of milk was introduced into the milk recording system, and as a result, a basis had been created for incorporating milk protein into the breeding programmes of the various breeds. This was done in 1986, when a new breeding value evaluation system - the "Direct-Updating" system - was brought into play. The reason for including protein in the breeding activities of

this country was a desire to change the protein/fat ratio of milk. Studies had demonstrated that although there was a strong genetic correlation between fat and protein production, a one-sided emphasis on protein production in favour of fat production would have the result that it would be possible to replace one half kg of butterfat by one half kg of protein per cow and year.

## **The Present**

#### **Direct Updating**

In 1986, the "Direct Updating" breeding value evaluation system was introduced, and at the same time new breeding values for yield were adopted, viz. the M-, F- and P-values describing the milk, fat and protein yields, respectively. In regard to the breeding activities of the various breeds, this opened up new possibilities for attributing different weightings to these traits, and based on their breeding objectives each individual breed was now able to decide how they wanted to weight the above traits. These decisions were taken into account in the calculation of a total performance index - the Y-index, which is calculated as follows:

$$Y\text{-index} = VM \times (M\text{-index} - 100) + VF \times (F\text{-index} - 100) + VP \times (P\text{-index} - 100) + 100,$$

where VM, VF and VP represent weighting factors.



Table 4 lists the weighting factors presently in force.

### BLUP

As from 1993, the breeding value calculations for bulls were changed, so that the "Direct Updating" system was replaced by a BLUP model. 1st lactation yield data are now included together with the yield data of granddaughters, if any. In addition, pedigree data are included as shown in figure 8. Data on the sires and dams of the bulls are included as well as data on previous generations.

The 1st lactation yields of the daughters are corrected as follows:

- Herd x year x region
- Calving month x year x area
- Age at calving
- The breeding values of the daughters' dams

This method yields reliable results and corresponds to the methods used in other countries. In

Figure 8. Illustration of the interrelationship between animal generations

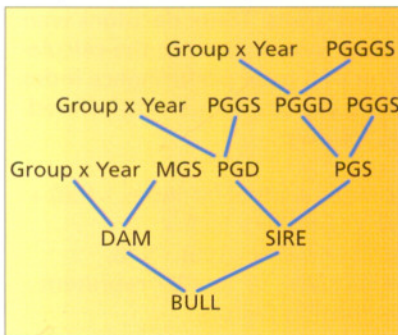


Table 4.

### Breeding objectives for yield in Danish dairy cattle breeds expressed as weighting factors used in the calculation of the Y-index

Weighting factors for

	M-index( $V_M$ )	F-index( $V_F$ )	P-index( $V_P$ )
Red Danish	-0.100	0.000	1.100
Black and White	-0.125	0.375	0.750
Danish Jerseys	-0.111	0.222	0.889
Red and White	-0.125	0.375	0.750
Others	-0.125	0.375	0.750

addition, this calculation system forms a good basis on which cattle breeders and the top-level management of the cattle breeding sector can make their decisions.

### The S-Index

In 1983, the top-level management of the cattle breeding sector discussed how best to utilize the great amount of data on traits other than the ones on yield; data collected i.a. via the milk recording system. In accordance with a proposal put forward by the National Institute of Animal Science and the Danish National Department for Cattle Husbandry, the upshot was a decision to introduce a total merit index - the S-index - to be used in the selection of breeding animals. The calculation of the S-index is based on such traits as yield, meat production, reproduction, mastitis resistance, conformation character and management traits. Weightings are attributed to the relative

breeding values of these traits which are determined by their predicted financial and biological long-term importance.

The S-index is a value, which under the prevailing conditions represent the best possible estimate of a bull's total true breeding value in respect of the traits that we want to improve in the relevant breed. Table 2 lists the traits that are at present included in the calculation of the S-index, and for each breed, the 1995 weighting factor is stated.

### The Herd-book

The Danish herd-book systems have been radically changed during the past few years, as computerization has created a totally new situation. In the mid-'80s all herd-book data were transferred to a computer system, which considerably increased the accessibility of the data both at the Danish National Department for Cattle Husbandry and at the local advisory centres. During the late '80s, the publication of printed herd-book



was brought to an end. This does not mean that the data contained in these herd-books have disappeared, only that they can now be shown on a computer screen. This is a far cheaper and more efficient system, and in addition the data applied are always up-to-date. In 1991, the Danish Ministry of Agriculture and Fisheries issued a new Government order on purebred breeding cattle; an order that was based on an EU directive. The order lays down the rule that the herd-book is made up of all registered purebred animals, and no quality demands can be made on entering an animal into the herd-book. Herd-book regulations can no longer be used to exert a strong influence on the development of a breed - it only determines what animals can be considered purebred. These new regulations mean that the Danish herd-books are now structured like in most other countries and contain the purebred animals also registered in the milk recording system.

## The Future

The breeding value evaluation system is being continually changed and improved, as research and scientific studies currently bring to light new knowledge.

In regard to yield, a switch to the application of the most advanced of BLUP models is planned for 1997 - the model is called the Animal Model or the individual animal model. This will mean a change of the calculation met-

Table 5.  
**Weighting factors used in the calculation of the S-index**

Egenskab	RDM	SDM	JER	DRK
Y-index	0.65	0.70	0.75	0.50
I-index	0.30	0.23	0.09	0.35
Daughter Fertility	0.30	0.32	0.29	0.25
Calving Ability	0.17	0.18	0.05	0.14
Mastitis Resistance	0.22	0.42	0.24	0.20
Body		0.21		0.19
Feet & Legs	0.14	0.36	0.10	0.34
Mammary System	0.41	0.35	0.36	0.51
Milking Speed	0.21	0.14	0.24	0.15
Temperament	0.06	0.04	0.08	0.03

hods both for cows and bulls. The new model differs from the models used so far in that it incorporates data on all known related animals. This method will result in small improvements of the breeding values of bulls, but the most important effect achieved will be a considerably improved reliability of the breeding values of cows. This in turn means that bull dams can be selected on a more reliable basis.

The breeding values for traits other than yield will also continue to be improved - based on improved registration methods and research results. At present considerable efforts are being expended on improving the breeding data available on fertility and health traits.

At the beginning of the '90s, the entire conformation evaluation system and the breeding values for conformation traits were reorganized, leading to an improvement of the reliability of the

data and to an adjustment to international standards.

### International Comparisons

During the last few years the exchange of breeding material across national borders has been on the rise. This leads to increased demands for methods to enable the conversion of national breeding values, so that the selection of breeding animals can take place on the basis of comparable breeding values.

The Interbull organization was established in order to create a common international basis for the calculation of internationally comparable values. Many countries have already joined this organization, which has its offices at the Agricultural University of Uppsala in Sweden.

A conversion of breeding values will only be possible if good animal family connecting lines can be established resulting in a broad knowledge of the genetic le-



vels of the countries involved. Interbull makes considerable demands on the quality of the breeding value evaluation systems of the individual countries, which have to be fulfilled before they are allowed to participate. The reason is that the conversion calculations would be incorrect if the national breeding value evaluation system did not function sufficiently well.

In February 1995, Interbull published the results of their calculations establishing an international ranking system for the bulls of the various member countries, and naturally these results had been awaited with great interest.

For the moment, Interbull's activities concentrate solely on yield, but the long-term objective is to include all other traits in the con-

version calculations.

Interbull was able to utilize data made available via the milk recording system, and this fact only serves to demonstrate the value of the very reliable Danish system for the registration of the basic data, that form the basis of the breeding value evaluation system.

#### **Conclusion**

In regard to the breeding activities of the coming years, the genetic progress made is expected to increase. This is partly due to improved breeding value calculation methods, and partly to improved possibilities for exchanging breeding material across national borders. Also a more intensive use of embryo transfer, cloning and sex determination techniques, etc. will contribute to

the promotion of genetic progress.

The precondition that must be fulfilled to achieve the desired genetic progress is that the breeding values must have high reliability. And this can in turn only be achieved if a considerable degree of attention is constantly paid to a country's registration and calculation activities, and if the breeding animals are not subjected to systematic and extraordinary treatments, such as e.g. the administration of the BST growth hormone.

Milk recording and breeding value evaluation will also be of central importance in the cattle breeding activities of the future. ■







# Milk Recording System and AI Work

by Søren Borchersen, head of department, National Department of Cattle Husbandry

Since the start in the 1930's, the cow number system used in the milk recording system has been employed in AI. When the management of the national milk recording system was transferred to the National Committee on Danish Cattle Husbandry in 1972, it meant better possibilities of coordinating the many tasks; it has been of particularly great importance to the use and exploitation of computer technology in the management of both breeding and production.

The first steps toward using EDP recording were taken in 1965 when the AI Society of the Horsens Region had statistics kept and membership fee bills printed out via EDP. Only in the early 1970's are the first steps taken towards making the AI work an integral part of the milk recording service.

The structure of AI work and the milk recording system has developed rapidly in the past 20 years. The number of 1st inseminations follows the development in the number of cows included in the milk recording system. The number of herds using inseminations has dropped severely over the past 20 years, due partly to the increase in dairy cattle herd size and partly to the smaller number of beef cattle herds. The change in structure has had great influen-

Table 6.

Development in number of inseminated and recorded cows

	1974	1984	1994
Number of 1. inseminations	1,295,986	1,100,881	827,138
Number of herds with inseminations	80,271	41,701	21,490
Number of AI societies	32	24	12
Number of recorded herds	28,348	18,386	11,739
Number of recorded cows	652,808	701,102	589,196
Number of recorded cows per herd	23.0	38.1	50.2

ce on the practical implementation and the organization of the AI work. About 80% of the calves born in herds included in the milk recording system are products of artificial insemination.

In 1975, the AI Societies acquired a new EDP programme that provided better possibilities of printing out statistics than previously, and in addition it became possible to update the semen production and the semen quality of the individual bulls. In 1979, questionnaires were prepared which could be printed out by LEC and distributed to the individual herd owners. Their answers should provide information on calvings, permitting statements to be prepared on: calving ease, the vitality of the calf and the size of the calf. This information was used in calculating a birth index for the individual bulls with a view to finding bulls that were suitable for heifer insemination.

In the first half of the 1980's the AI societies, collaborating

with the milk recording service at the TeleProcessing (TP) stations, started to report inseminations. The CKR (Danish Central Cattle Register) register and tagging were introduced at the same time.

In 1985, all AI societies used the common computer system from which data could be transferred to the data base of the milk recording system. At the TP stations the insemination and other information was entered continuously so that this information could be transferred and be available for the milk recording system and subsequently printed out for the individual animals on barn sheets and the various other print-outs.

The cooperation of the AI societies and the milk recording system concerning the use of records was extended in 1986 to include calving information. The AI society questionnaires concerning calving information were replaced by the possibility of reporting on the barn register voucher information concerning calving ease

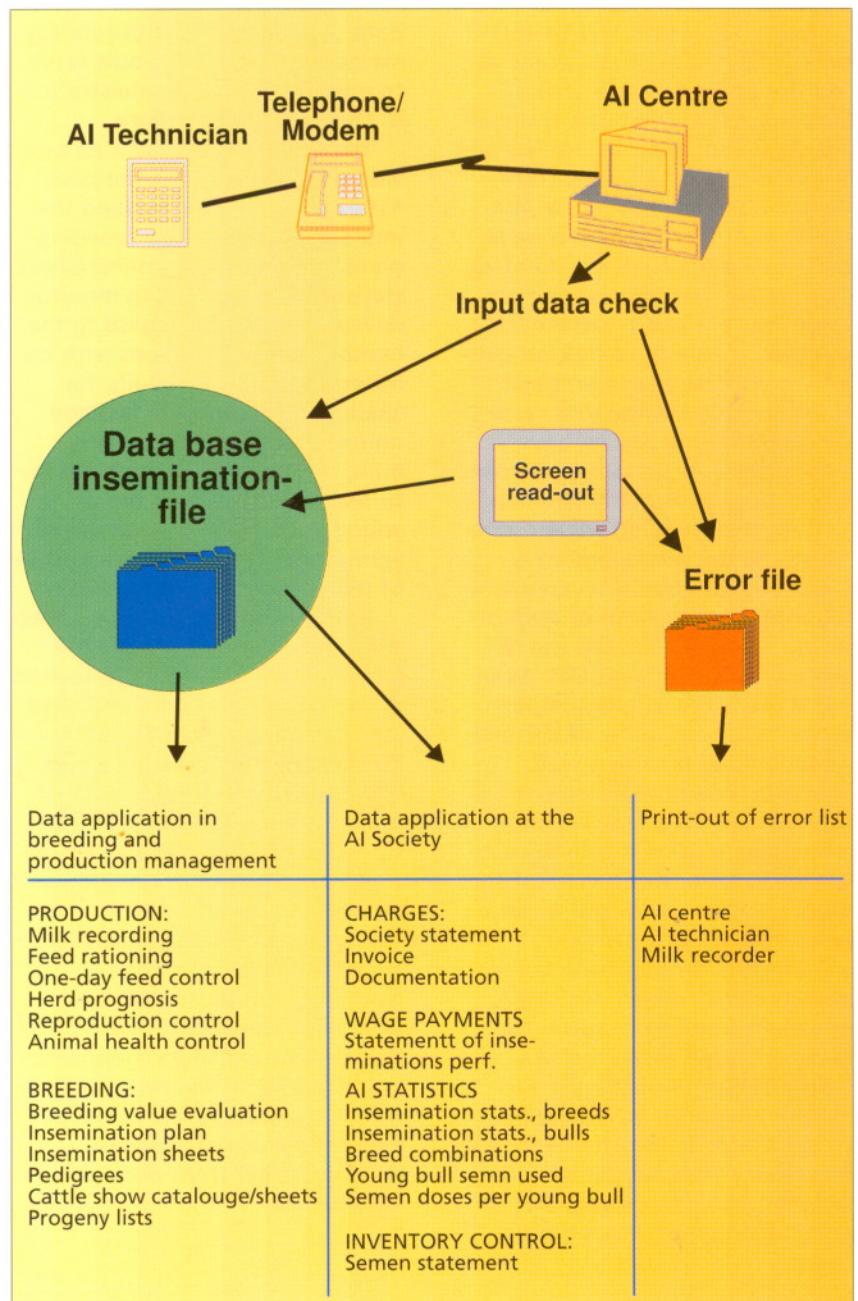


etc. for the calculation of birth indices for each individual bull.

As from the summer of 1991, the reporting of insemination information became a fully integral part of the milk recording system via the joint cattle data base. All registrations from the AI work are now reported straight to the AI section of the cattle data base, and from here the data can be printed out for use in the AI societies and in the production management. One result of this is that the farmer's computer print-outs for the individual animals are updated faster with insemination and reproduction information.

In addition, the new EDP system has provided the following advantages:

- Faster and more dependable error correction procedure.
- Inseminations and treatments become available on print-outs faster.
- Several new print-outs for both AI societies, AI technicians, and members.
- The print-outs form the basis for the remuneration of AI technicians and for the bills sent to the members of the AI societies.
- Possibility of stock management at the bull station laboratories and in the AI technicians' semen containers.
- Information registered from the AI work can be used efficiently in production management.





Today, all AI information is reported by means of electronic data transfer from the AI technician's portable computer terminal via a telephone modem to the office of the AI society, and from here it is transferred to the insemination file in the data base at LEC (the Agricultural EDP Centre). This means that information on inseminations and treatments is updated by the AI technician with a maximum delay of two days. Herds included in the milk recording system thus always have their print-outs updated with the latest insemination information.

Both the breeding value assessment and the management systems are thus based on an unambiguous identification of each individual animal, and the use of the animal's nine-digit CKR number is therefore of great importance to the reliability of the insemination and breeding work. The data base insemination file is also used for AI and production management, and it offers great potential for printing out statistics with information for use by both advisers and cattle farmers.

With the development of the new joint EDP system for cattle, many different print-outs have been prepared along the way which the societies can use for maintaining and improving their work. There are print-outs for the day-to-day administration of the AI technician's work, registration and correction of insemination

data, and invoicing of the society members. These print-outs serve to ensure efficient administration of the insemination work.

The insemination statistics provide the societies with the basis for controlling and checking the implementation of the breeding plans. Based on the insemination statistics, it is possible to monitor developments with regard to the number of inseminations with the different breeds and bulls, for example. To achieve a fast and uniform testing of the young bulls, it is possible to print out information on member use of young bulls, AI technician use of young bulls, and the consumption of semen from the young bulls.

With print-outs from the semen stock management system, the development in semen production as well as sale and purchase of semen can be monitored. In the EDP system the AI society can register the society's total stock of semen. That gives a good overview that can help reduce semen waste and costs of production and purchase of semen.

The AI technician statistics are an aid in the society's strategic planning. It is through the AI technician statistics that the society can monitor the development in the quality of the insemination work. In addition, the development in the use of pregnancy tests and other treatments can be monitored.

When registering inseminations made in herds included in the milk recording system, the following is calculated:

- Number of 1st inseminations
- Average number of days from calving to 1st insemination
- Average number of days from insemination to pregnancy test
- 0-56 days non-remater percentage
- Number of inseminations per female animal

From the joint data base it is further possible to print out a reproduction statement that states the reproduction status of the herd. To assist in controlling and checking the reproduction in the herd, the control lists "Non-bred/bred animals" can be used for pointing out animals that should be subjected to rut observation, pregnancy testing or reinsemination. The cattle farmer and adviser thus have several possibilities of drawing on the vast information in the data base for use in the everyday and strategic control of the herd's production.

To give an example of a control list, the figure below shows an EDP insemination plan. The insemination plan can be printed out in connection with each milk recording, for example, and it gives the cattle farmer suggestions re-



garding which bulls could be used for each individual cow and heifer. The insemination plan ensures that inbreeding is avoided, that the young bulls are used appropriately, and that the best proven bulls are used as quickly as possible. The insemination plan can help the cattle farmer obtain the greatest possible share of the progress achieved through breeding.

Today, registrations obtained through the insemination work can be used for both production and breeding work at population level as well as at the individual herd level. The development in the requirements for the registrations made will continue towards ever more sophisticated solutions which will permit an exact description of all events from the time when the semen is produced at the bull station until it has re-

sulted in a pregnancy and until the production result of the expected offspring is available. Quality in the insemination work and the registrations made will become a precondition for the future cattle breeding and insemination work. This work will be strengthened in the future through research into semen production and biotechnology combined with the use of information data bases nationally as well as internationally.

Figure 10.

Landsudvalget for Kvæg		Egen udskrift		Ins.plan, kær og kvier	
		CKR-nr.:	Udskrevet: 14.11.94		Side:
CKR-dyrnr	Født	Sidste ins Nr Ins tyr		-----Tyreforlag-----	
0611	6.12.85	4	23.09.94	RGK Lotus	CEN Erri
0672	14.10.86	1	11.10.94	ØJY Mabru	HJ Vogd
0714	31.05.87	2	30.09.94	HJ Vogd	RGK Nyt
0750	14.11.87	3	13.07.94	RGK Lotus	RGK Lotus
0811	30.09.88	3	6.04.94	RGK Lotus	CEN Erri
0816	2.11.88	1	30.05.94	US Arizona	HJ Vogd
0817	12.11.88	4	11.09.94	ØJY Mabru	RGK Lotus
0828	11.12.88	1	22.08.94	ØJY Mabru	CEN Erri
0849	27.02.89	1	27.07.94	ØJY Mabru	ØJY Lotus
0850	28.02.89				
0855	20.04.89				
0864	24.04.89				



