

Organic Milk Production in the USA

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Organic dairy production

- Dairy animals have been certified organic by an approved USDA agency to label their milk or dairy animals as organic
- Feed must be 100% organic
- Health care within organic requirements (antibiotics and hormones are not allowed)
- Pasture is mandated (at least 30% of DMI for 120 days)
- Housing must allow for freedom of movement
- Records maintained on feed and health
- Prevention is key!



Dairy animals must be fed and managed organically for 1 year prior to the production of organic milk.



Animals cannot be rotated between organic and non-organic production.



All animals must have access to outdoors

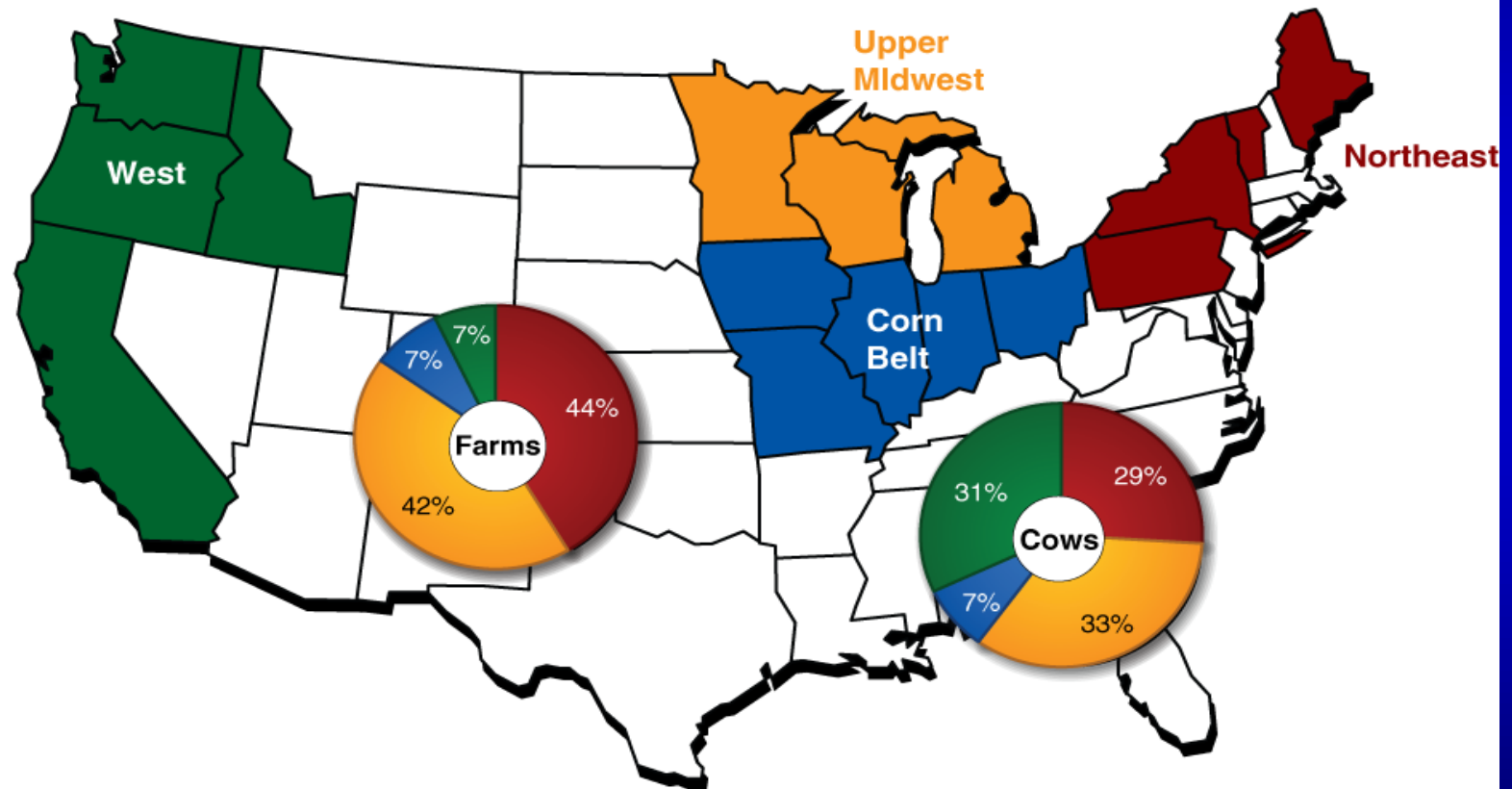


Organic dairy farms in the US

Figure 7

Share of organic dairy farms and milk cows in each region

Only 7 percent of organic dairy farms were in the West region, but these farms held 31 percent of organic milk cows



Source: ERS calculations based on data from USDA's 2005 Agricultural Resource Management Survey, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Organic Herd Size USA



Organic Milk Price USA

Over 25 Years of Sustainable Farmer Pay

MIDWEST MAILBOX DAIRY PAY PRICE



Challenges of producing high quality organic milk

- No use of antibiotics, including dry cow treatments
- No hormones (Lutalyse, oxytocin)
- 100% organic feed (grain and forages)
- Outside access (365 d) when possible
- Pasture requirement (>30% DMI)
- One milk replacer (expensive)
- Various products such as Orbesal are not acceptable



Organic dairy production challenges

- **More management time is needed**
 - **Fencing**
 - **Record keeping**
- **Fewer health products allowed**
- **Possible higher costs of feeds, seeds, and fertilizers**

Organic dairy production challenges, cont.

- **Change of farming system to allow for open housing and pasture for all animals**
- **Less information available on organic dairy production, but this is changing!**
- **Cost of certification is €450-€1,400 per year**
- **Records must be maintained on all aspects of the farm**

Major challenges

1. Cost of fuel
2. Cost of feed
3. Cost of other purchased materials (besides fuel, seed)

Research needs

1. Nutritional studies on organic foods
 2. Soil health
 3. Soil fertility
 4. Food quality/safety
- (Livestock health was #5, Milk quality was #7)

US organic and conventional somatic cell count

Variable	Organic	Conventional
Average number of cows	91	192
Daily yield per cow (kg)	22.8	30.9
SCC < 100,000 (%)	3.1	1.0
100,000 – 200,000 (%)	6.3	30.3
200,000 – 300,000 (%)	43.8	42.4
300,000 – 400,000 (%)	31.3	18.2
SCC > 400,000 (%)	15.6	8.1

Zwald et al. (2004)

Organic versus Non-organic dairies in Minnesota

Variable	Organic	Non-organic
Average number of cows	112	228
Milk per cow (kg)	7,121	11,295
Death rate (%)	3.5	5.5
Culling rate (%)	23.4	33.6
Feed cost (€/cow)	4.43	4.88
Milk price (€/kg)	0.29	0.16
Net return (€/cow)	1,121	306

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Welcome to the West Central Research and Outreach Center!



Daily Weather



What's happening at the WCROC

- **Rob Gardner** is a new faculty member at the WCROC, a joint position with the Dept of Bioproducts and Biosystems Engineering. He joins us as an Assistant Professor of Renewable Energy Systems and Sustainability.
- The WCROC welcomes Dr. Shiquan Cui, associate professor from the Northeast Agricultural University in Harbin, China. She will be working with Dr. Yuzhi Li on swine behavior and welfare through May 2015.

West Central Research and Outreach Center
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Morris, MN 56267
[Map to the WCROC](#)
(Google Map)

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Welcome to the University of Minnesota's West Central Research and Outreach Center (WCROC)! The WCROC is part of the College of Food, Agricultural and Natural Resource Sciences and is one of nine such Centers located around the state of Minnesota. Our applied research programs cover crop production, dairy production, horticulture, water quality, renewable energy, and swine production.

Our land and facilities provide research opportunities for

WCROC dairy herds

- Organic herd

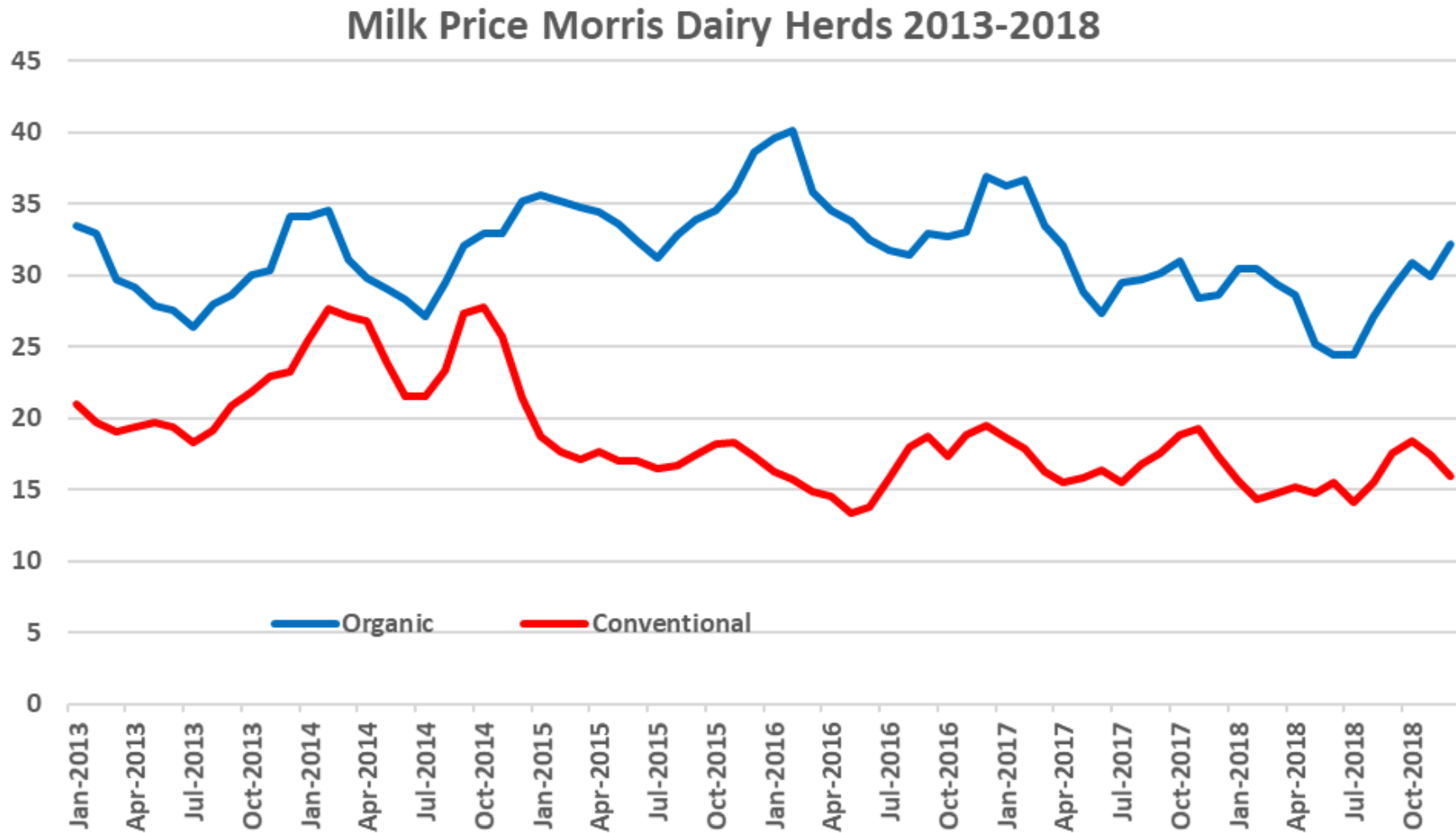
- Grazing season May to October/November
 - Pasture and supplemented with 6 lbs of corn/cow/per day
- Winter season November to April
 - Compost bedded pack or outdoor straw pack
 - Organic TMR- corn silage, alfalfa haylage, corn, soybean meal, and minerals

- Low input conventional herd

- Similar to organic, straw bedded pack
- TMR year round
 - Corn silage, alfalfa haylage, corn, soybean meal, and minerals



WCROC dairy milk price





Organic
Research
Farm
Do Not
Spray

Pasture as the only Feedstuff

- Research has shown that pasture alone can support 40-50 lb. of milk in spring
 - High genetic potential of cows
 - What about cows genetically adapted to pastures?
- Cows will typically consume 3% of BW in forage (3.25% in high producing cows)
- Usually lose more body condition
- Long term effects on body condition and reproduction???



Production traits

Trait	Grass	Low grain	High grain
Cows	51	51	51
Milk (kg)	14.3 ^a	17.4 ^b	18.6 ^b
Fat (%)	3.6	3.6	3.6
Protein (%)	3.2	3.3	3.3
SCS	3.30	3.34	3.05
MUN	14.7 ^a	10.9 ^b	8.7 ^c
Energy-corrected milk	14.3 ^a	16.2 ^b	17.0 ^b

Averages are across the grazing season from May to September

Means within rows with different superscripts are significantly different ($P < 0.05$)

Milk fatty acids

Fatty acid	Grass	Low grain	High grain
	----- (%) -----		
Monounsaturated	1.01 ^a	0.89 ^{a,b}	0.79 ^b
Polyunsaturated	0.12	0.11	0.10
Omega-3	0.06 ^a	0.04 ^b	0.04 ^b
Omega-6	0.07 ^a	0.07 ^b	0.07 ^a
Omega 6-3 ratio	1.4 ^a	1.9 ^b	2.4 ^c
Omega 3-6 ratio	0.74 ^a	0.51 ^b	0.42 ^c
ALA + CLA	1.23 ^a	0.83 ^b	0.72 ^b

Rows with common superscripts are not different ($P < 0.05$)

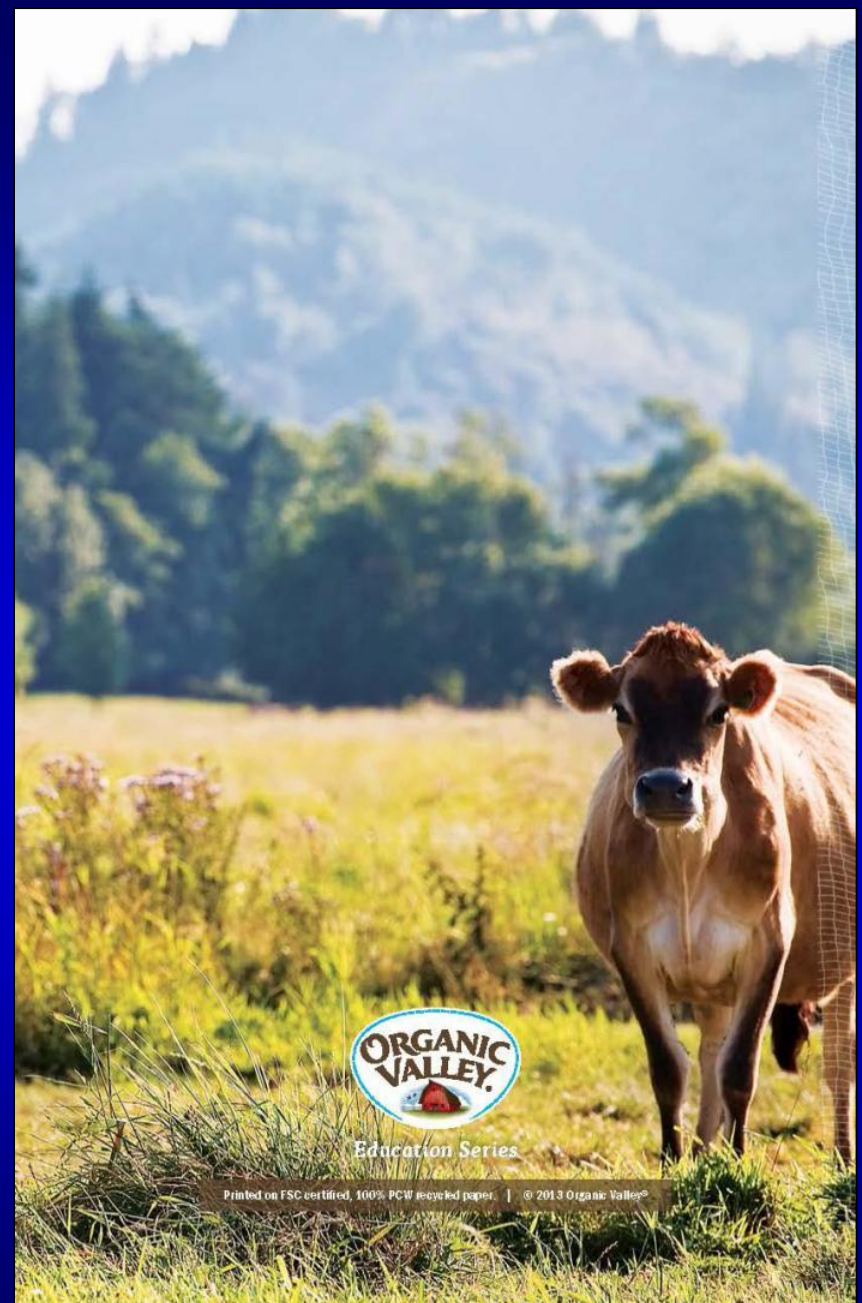
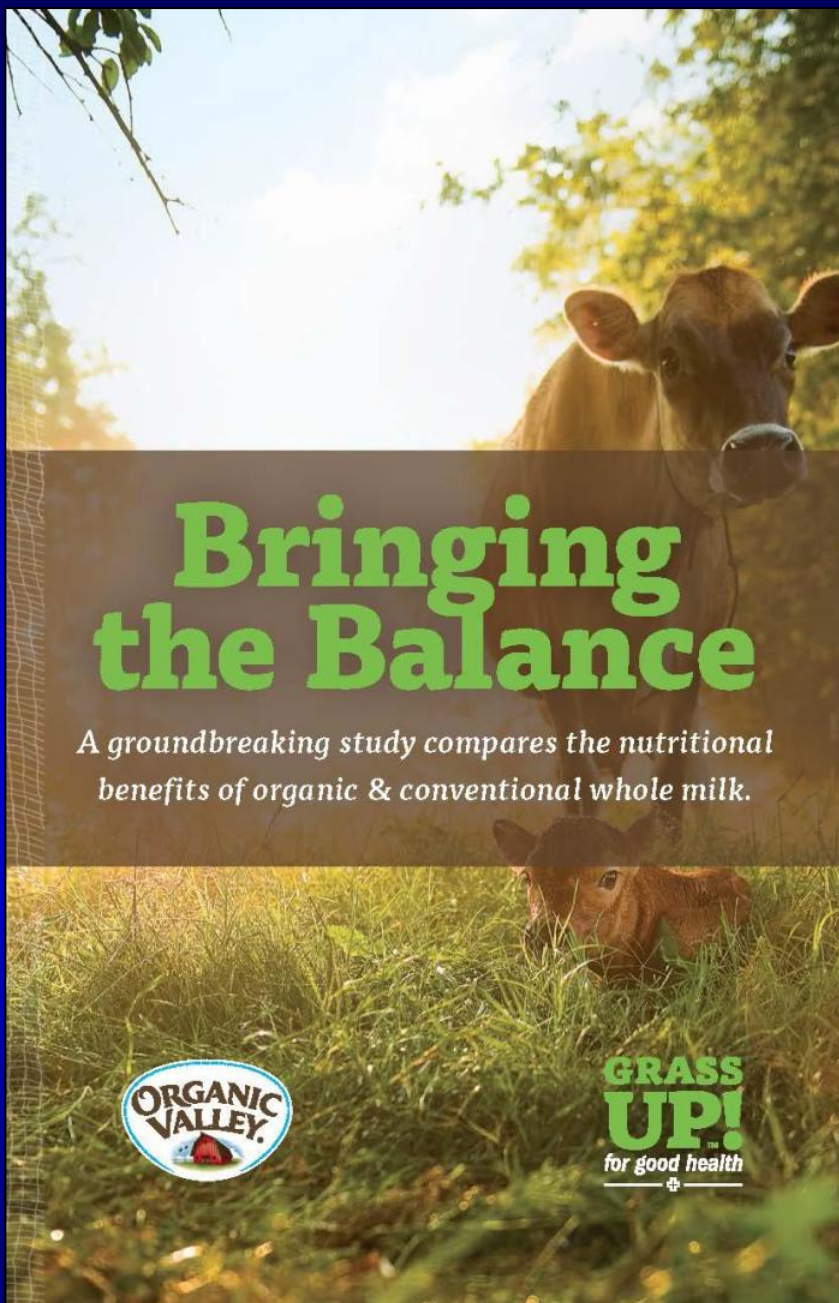
Profitability

Item	Grass	Low grain	High grain
	----- (€/cow/day) -----		
TMR	0.00 ^a	2.86 ^b	4.25 ^c
Pasture	2.33 ^a	1.50 ^b	1.53 ^b
Revenue	7.77 ^a	9.54 ^b	9.83 ^b
Profit per day	5.16 ^a	5.12 ^a	4.01 ^b
Low corn price	5.16	5.42	5.03
Grassmilk price	6.00 ^a	5.12 ^b	4.01 ^c

Rows with common superscripts are not different ($P < 0.05$)

No Grain Take Home Message

- Don't go cold turkey
 - Ease into increased pasture intake
 - Gradually decrease supplements, allow system (pastures, animals, management) to adjust
- No-grain diet not recommended for beginning grazers
- Develop high quality pastures
- May need ~50% more pasture for no-grain diet
- Consider keeping a little grain in the ration unless economics or market dictates otherwise



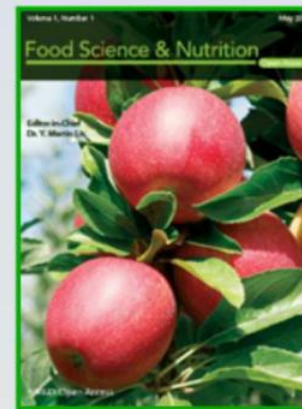
Benbrook et al. "Organic Production Enhances Milk Nutritional Quality by Shifting Fatty Acid Composition: A United States-Wide, 18-Month Study." Public Library of Science One. December 9, 2013.



"Enhancing the Fatty Acid Profile of Milk through Forage-Based Rations, with Nutrition Modeling of Diet Outcomes"

PUBLISHED IN *Food Science and Nutrition* in 2018

- Peer reviewed journal
- Focused on the impacts of ag production systems on food quality, nutrition, and health



THE TEAM -- PAPER CO-AUTHORS



Charles M. Benbrook, Donald R. Davis, Bradley J. Heins, Maged A. Latif, Carlo Leifert, Logan Peterman, Gillian Butler, Ole Faergeman, Silvia Abel-Caines, Marcin Baranski

**Resources on the
study accessible at:**



Hygeia
Analytics

www.Hygeia-Analytics.com

<https://hygeia-analytics.com/nutrition/organic-vs-conventional-foods/2018-grassmilk-paper/>

Study Outline

DURATION

2014 36 months of testing **2016**

**INDEPENDENT,
ACCREDITED LAB**

 **SILLIKER**
a Mérieux NutriSciences Company



1,163 raw milk

**GRASSMILK
SAMPLES**



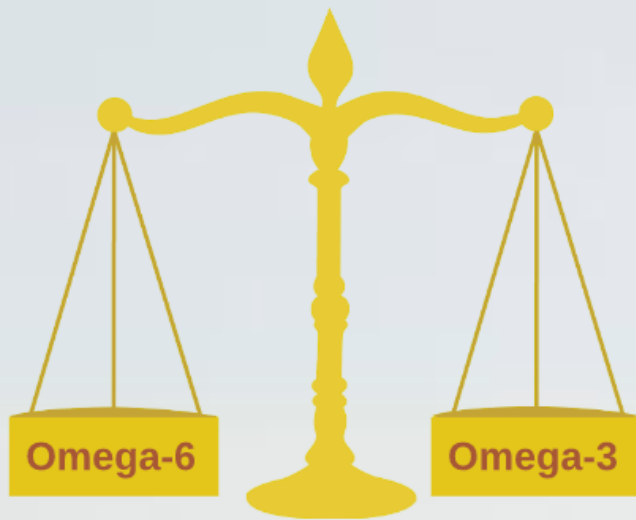
69 processed
+ bottled



**MILK FROM
THREE REGIONS**

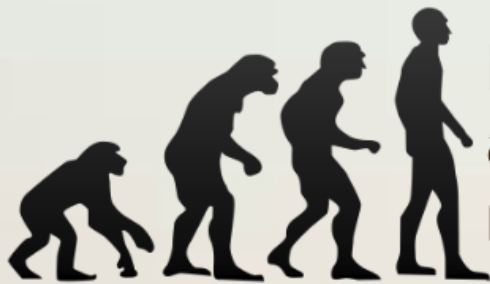
Northeast, Midwest,
and California

Balance is Key



BALANCED intake of Omega-6 and Omega-3 fats promotes heart health and can help prevent obesity and diabetes

EVOLUTIONARY RATIO



Human's evolved with an Omega-6:Omega-3 ratio of about 1 to 1

**AVERAGE
TODAY**

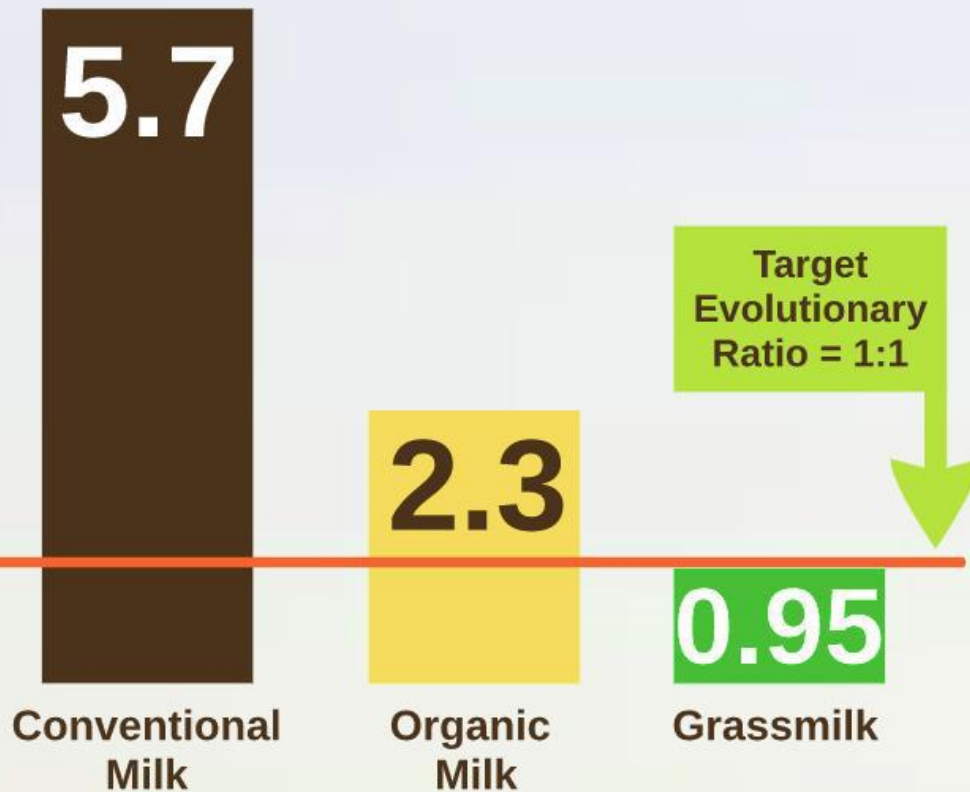
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Omega-6 to
Omega-3 Ratio

WAY TOO HIGH FOR OPTIMAL HEALTH!

Omega-6 : Omega-3 Ratio

The Omega-6 to Omega-3 **RATIO OF GRASSMILK IS A REMARKABLY LOW 0.95**, compared to the still healthy 2.3 in organic milk and 5.7 in conventional milk. Plus grassmilk has **123% MORE CLA THAN CONVENTIONAL MILK!**



100% Grass-fed Dairy Standard

Five Fundamentals

- **No grain. Cows eat a diet of high quality forages (pasture and hay) along with needed supplements like essential vitamins and minerals.**
- **Pasture is a priority. Cows must get the majority of their feed from good quality and well managed pastures during the grazing season.**
- **Animal health is first. Wellness checks or veterinarian oversight are required, these are not voluntary options – cows and calves must be healthy.**
- **NO antibiotics, NO growth hormones, NO GMOs.**
- **Yearly farm inspections. A 100% grass-fed farm receives a yearly on-farm review.**

Treatment Options for Organic Dairy



Herd Health

Most organic farms experience fewer health problems under organic management than when they were conventional

- **Prevention is the key to Organic Herd Health management**
 - Higher forage/less grain feeding, Grazing – exercise, and soil health all positively impact immune health
- **Tools are available in case prevention is not enough**
 - Most vitamin preparations, mineral supplements and vaccines are allowed
 - Specific synthetic materials are allowed (such as electrolytes, dextrose, flunixin, and others)
 - Natural products are often used (herbal tinctures, colostrum based whey products, topical liniments and salves, etc.)

Health care practices

- **Focus on conditions that create a healthy environment and enhance the immune system**
- **Synthetic medications must be on “Livestock Accepted Health Products List” - no antibiotics, but to save the animal**
- **Diet to meet nutritional requirements**
- **Proper housing and care**
- **Physical alterations that benefit health – dehorning ok**
- **Administration of vaccines and biologics – avoid parasiticides**

Organic dairy treatments

- Frequent stripping
- Using calves on high cell count cows
- Herbal and homeopathic treatments, both orally and intra-mammary
- Aloe injections, pellets and infusions
- Aspirin (very common)
- Garlic given orally (whole cloves)
- Kelp (free-choice, boosts immune system)
- Ship cow to conventional neighbor
- Peppermint liniment
- Vitamin/mineral injections (Mu-Se)
- Fluids (glucose, electrolytes)



Aloe Vera



- ***Anti- Inflammatory*** – reduced swelling in animal model better than hydrocortisone
- **Works synergistically with aspirin**
- ***Immune Support*** – stimulates antibody production and T cell function in the presence of steroids
- **Available as liquid or pellet**

Garlic – Nature's Antibiotic



**Available as tincture, liquid, dry
(capsule or powder)
Raw bulbs – strength varies,
can be caustic**

Useful for bacterial and parasitic infections

**Other antibacterials – goldenseal, eucalyptus,
tea-tree oil**

Group feeding of calves and pasture at an early age



Nurse cows

(managed as a separate group)

- Excellent way to raise calves
- Reduce labor expense
- Keeps poorer milk out of tank
- Keeps contagious cows away from uninfected cows
- Reduce milk being shipped if needed
- NEVER use a known Johnes positive COW



Troubleshooting herd health problems

An ounce of prevention is worth...??

In the Organic Dairy world, prevention is everything.

Clean and Dry --- all the time.





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<https://wcroc.cfans.umn.edu/research-programs/dairy>