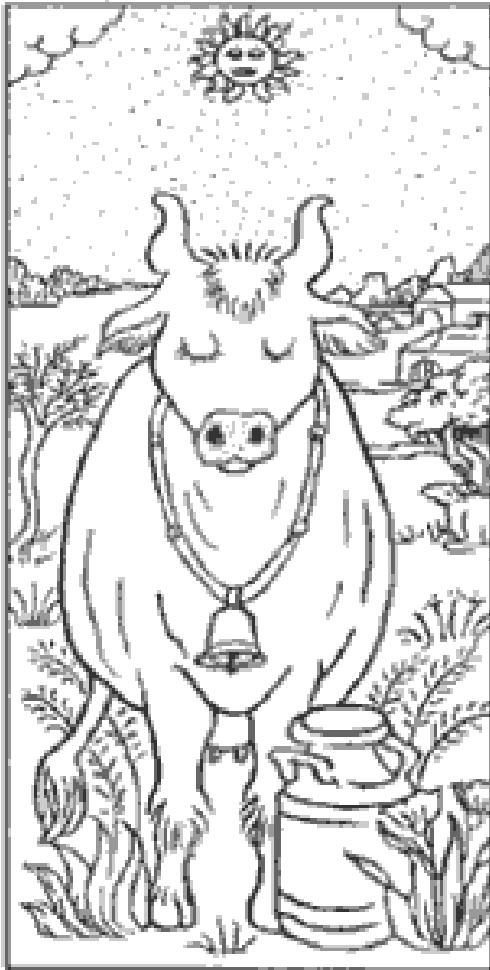


A Campaign for

Real Milk



FULL-FAT
PASTURE-FED
UNPROCESSED

By the Weston A. Price Foundation

A Campaign for Real Milk Is a Project of
The Weston A. Price Foundation
westonaprice.org

This document is posted at realmilk.com.
Updated September, 2011

Presentation Topics

1. Is Real Milk Safe?
2. Is Real Milk More Nutritious?
3. Is Milk from Pastured Cows More Nutritious?
4. Is Real Milk Better for Farmers?

ACKNOWLEDGEMENTS

With thanks to the following for help in preparing this presentation:

Lee Dexter, President, White Egret Farms

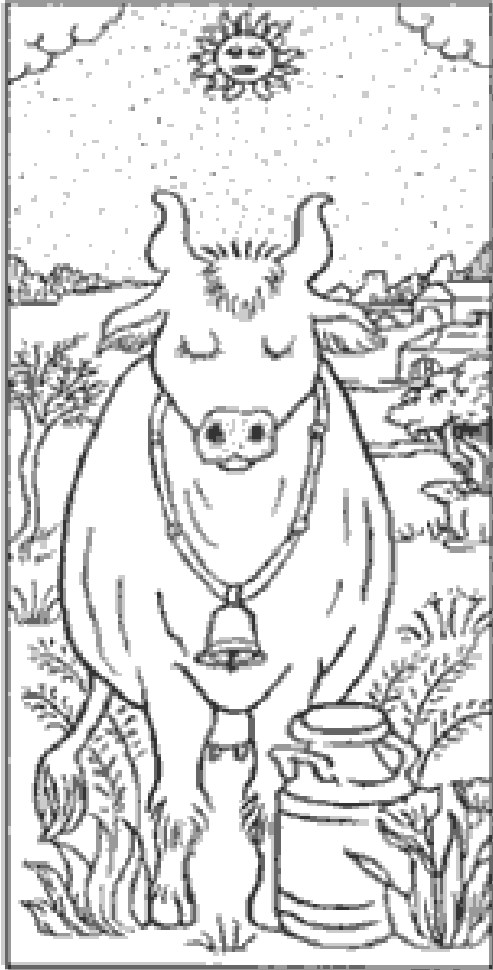
Ron Hull, PhD

Jill Nienhiser

Chris Masterjohn

Ted Beals, MD

Part 1: Is Raw Milk Safe?



“Drinking raw milk or eating raw milk products is like playing Russian roulette with your health.”

*—John F. Sheehan, Director,
US Food and Drug Administration,
Division of Dairy and Egg Safety*

FDA Consumer, Sept/Oct 2004.

Raw Milk Is Uniquely Safe



Consider the calf, born in a muddy pasture, which then suckles on its mother's often manure-covered teat. How can that calf, or any mammal survive?

Because raw milk contains multiple, natural, redundant systems of bioactive components that can reduce or eliminate populations of pathogenic bacteria.

Built-In Protective Systems in Raw Milk:

Lactoperoxidase

- Uses small amounts of H_2O_2 and free radicals to seek out and destroy bad bacteria¹
- Found in all mammalian secretions—breast milk, tears, saliva, etc.^{1,2}
- Levels are **10 times higher** in goat milk than in breast milk³
- Other countries are looking into using lactoperoxidase instead of pasteurization to ensure safety of commercial milk as well as for preserving other foods^{1,2,4,5}

1. *Indian J Exp Biology*, 1998;36: 808-810.

2. *British J Nutrition*, 2000;84(Suppl. 1.): S19-S25.

3. *J Dairy Sci*, 1991;74:783-787.

4. *Life Sciences*, 2000;66(25):2433-2439.

5. *Trends in Food Science & Technology* 16 (2005) 137-154

Built-In Protective Systems in Raw Milk:

Lactoferrin

- Plentiful in raw milk; effectiveness greatly reduced by pasteurization¹
- Steals iron away from pathogens and carries it through the gut wall into the blood stream; has anti-inflammatory properties; stimulates the immune system¹
- Kills wide range of pathogens including viruses; does not kill beneficial bacteria.²
- In a study involving mice bred to be susceptible to tuberculosis, treatment with lactoferrin significantly reduced the burden of tuberculosis organisms.³
- Mice injected with *Candida albicans*, another iron-loving organism, had increased survival time when treated with lactoferrin.⁴
- Believed to cut visceral fat levels by as much as 40%.⁵ Many other health benefits—is sold as a supplement!
- FDA approved for use in anti-microbial spray to combat *E. coli* O157:H7 contamination in meat industry!⁶

1. *British J Nutrition*, 2000;84(Suppl. 1):S11-S17; *JACN* 2001 20(5):389S-395S.

2. Zimecki and Kruzel. *J Exp Ther Oncol*. 2007;6(2):89-106; *International Dairy Journal* 2006 16:1252-1261

3. *J Experimental Med*, 2002 DEC 02;196(11):1507-1513.

4. *Infection and Immunity*, 2001 JUN;69(6):3883-3890.

5. *MSN-Mainichi Daily News*, 2007 APR 11.

6. *FDA News*, August 22, 2004

Built-In Protective Systems in Raw Milk:

Other Bioactive Components I – Components of Blood

- **Leukocytes**—Eat all foreign bacteria, yeast and molds (phagocytosis). Destroyed at 56C and by pumping milk. Produce H_2O_2 to activate the lacto-peroxidase system. Produce anaerobic CO_2 that blocks all aerobic microbes. Basis of immunity.
- **B-lymphocytes** – Kill foreign bacteria; call in other parts of the immune system^{1,2}
- **Macrophages** – Engulf foreign proteins and bacteria²
- **Neutrophils** – Kill infected cells; mobilize other parts of the immune system¹
- **T-lymphocytes** – Multiply if bad bacteria are present; produce immune-strengthening compounds¹
- **Immunoglobulins (IgM, IgA, IgG1, IgG2)**--Transfer of immunity from cow to calf/person in milk and especially colostrum; provides “passive immunization”²
- **Antibodies**—Bind to foreign microbes and prevent them from migrating outside the gut; initiate immune response.

1. *Scientific American*, December 1995.

2. *British J of Nutrition*, 2000:84(Suppl. 1):S3-S10, S75-S80, S81-S89, S135-136.

Built-In Protective Systems in Raw Milk:

Other Bioactive Components II – Fats and Carbohydrates

- **Polysaccharides**—Encourage the growth of good bacteria in the gut; protect the gut wall
- **Oligosaccharides** – Protect other components from being destroyed by stomach acids and enzymes; bind to bacteria and prevent them from attaching to the gut lining; other functions just being discovered.^{1,2}
- **Medium-Chain Fatty Acids**—Disrupt cell walls of bad bacteria; levels so high in goat milk that the test for the presence of antibiotics had to be changed; may reduce intestinal injury and protect the liver.³
- **Phospholipids and Spingolipids**—bind to intestinal cells, prevent absorption of pathogens and toxins.³ Spingolipids are important components in cell membranes, protect cells against toxins, support digestion and protect against cancer.

1. *British J Nutrition*, 2000;84(Suppl. 1):S3-S10.

2. *Scientific American*, December 1995.

3. *International Dairy Journal* 2006 16:1374-1382 and 1362-1373

4. Spingolipids and Cancer, scitopics.com; Koopman, J S, et al, *AJPH*, 1984, 74:12:1371-1373

Built-In Protective Systems in Raw Milk:

Other Bioactive Components III

- **Enzymes, e.g. Complement & Lysozyme**—Disrupt bacterial cell walls. Complement destroyed at 56C; Lysozyme at 90C.^{1,2}
- **Hormones & Growth Factors** – Stimulate maturation of gut cells; prevent “leaky” gut.²
- **Mucins** – Adhere to bacteria and viruses, preventing those organisms from attaching to the mucosa and causing disease.^{1,2}
- **Fibronectin** – Increases anti-microbial activity of macrophages and helps to repair damaged tissues.¹
- **Glycomacropeptide** – Inhibits bacterial/viral adhesion, suppresses gastric secretion, and promotes bifido-bacterial growth; supports immune system.³

1. *British J Nutrition*, 2000:84(Suppl. 1):S3-S10.

2. *Scientific American*, December 1995.

3. *British J Nutrition*, 2000:84(Suppl. 1):S3-S10, S39-S46

Built-In Protective Systems in Raw Milk:

Other Bioactive Components IV

- **Beneficial Bacteria** – *Lactobacilli* and *bifidus* bacteria, crowd out bad bacteria, product lactic acid that kills bad bacteria.
- **Bifidus Factor** – Promotes growth of *Lactobacillus bifidus*, a helpful bacteria in baby's gut, which helps crowd out dangerous germs^{1,2}
- **B₁₂ Binding Protein** – Reduces Vitamin B₁₂ in the colon, which harmful bacteria need for growth¹
- **Lactoglobulins:** Carry vitamins A and D and possibly other nutrients.³

1. *Scientific American*, December 1995.

2., *British J Nutrition*, 2000:84(Suppl. 1):S3-S10, S39-S46.

3. *FEBS Journal* 2009 276:2251-2265.

Fivefold Protective System in Raw Milk

1. Destroys pathogens in the milk.
2. Stimulates the Immune system.
3. Builds healthy gut wall.
4. Prevents absorption of pathogens and toxins in the gut.
5. Ensures assimilation of all the nutrients.

Destruction of Built-In Safety Systems by Pasteurization

Component	Breast Milk	Raw Milk	Pasteurized Milk	UHT Milk	Infant Formula
B-lymphocytes	active	active	inactivated	inactivated	inactivated
Macrophages	active	active	inactivated	inactivated	inactivated
Neutrophils	active	active	inactivated	inactivated	inactivated
Lymphocytes	active	active	inactivated	inactivated	inactivated
IgA/IgG Antibodies	active	active	inactivated	inactivated	inactivated
B ₁₂ Binding Protein	active	active	inactivated	inactivated	inactivated
Bifidus Factor	active	active	inactivated	inactivated	inactivated
Medium-Chain Fatty Acids	active	active	reduced	reduced	reduced
Fibronectin	active	active	inactivated	inactivated	inactivated
Gamma-Interferon	active	active	inactivated	inactivated	inactivated
Lactoferrin	active	active	reduced	inactivated	inactivated
Lactoperoxidase	active	active	reduced	inactivated	inactivated
Lysozyme	active	active	reduced	Inactivated	inactivated
Mucin A/Oligosaccharides	active	active	reduced	reduced	inactivated
Hormones & Growth Factors	active	active	reduced	reduced	Inactivated

1. *Scientific American*, December 1995.
2. *The Lancet*, 17 NOV 1984;2(8412):1111-1113.

Destruction of Built-In Safety Systems by Pasteurization II

- Milk's anti-microbial properties have been detailed only recently, but the destruction of protective properties was recognized as early as 1938 in studies showing that raw milk did not support the growth of a wide range of pathogens.
- Researchers noted that heating milk supports the growth of harmful bacteria by inactivating “inhibins” (factors that inhibit bacterial growth).

The Drug and Cosmetic Industry, 1938:43:1.

What is Pasteurization?

- PASTEURIZATION is a process that slows microbial growth in food.
- NOT INTENDED TO KILL ALL PATHOGENS: Pasteurization is not intended to kill all pathogenic micro-organisms in the food or liquid, but aims to reduce the number of viable pathogens so they are unlikely to cause disease.
- TWO MAIN TYPES of pasteurization used today:
 1. High Temperature/Short Time (HTST): 161° F for 15-20 seconds
 2. Ultra-Heat Treated (UHT): 280° F for fraction of second
- RAPID HEATING: Both treatments involve rapid heating by forcing the milk between super heated stainless steel plates.

Coliforms – not the same as pathogens

- Rod-shaped bacteria found everywhere in the environment, including the gut, the feces, soil, water and plants.
- Four main groups: *E.coli*, *Kiebsiella*, *Enterobacter*, *Citrobacter*.
- Key characteristic: ferment lactose into lactic-acid.
- “. . . Research results have shown that total coliforms may not be an appropriate bacterial indicator of fecal pollution.”
- “. . . Significant concentrations of coliforms in distribution systems do not represent a health risk to water consumers.”
- “With few exceptions, coliforms themselves are not considered to be a health risk. . .”
- “It is widely accepted that the total coliform group of bacteria is diverse and they can be considered normal inhabitants of many soil and water environments that have not been impacted by fecal pollution.”

Coliforms in raw milk inhibit pathogen growth

- *Enterococci* (considered “virulent” and/or “antibiotic resistant” in hospitals) inhibit pathogens such as *Listeria* in raw feta cheese.
eurekalert.org, April, 2008.
- *Lactobacillus* and *staphylococcus* produce bacteriocins against *L. Monocytogenes* and are sold as commercial starters to control listeria.
Hull. Australian Journal of Dairy Technology Aug 2007;62(2):100-102
- *Staphylococci*, *Streptococci*, *Lactobacillis* and *Ent. faecalis* in raw human milk inhibit pathogenic *Staph aureus*.
Heikkila and Saris. J Appl Microbiology 2003,95, 471-478

New Medical Paradigm- Coliforms Essential

- **OLD PARADIGM:** Healthy human body is sterile and microbes attack it, making us sick.
- **NEW PARADIGM:** Healthy human body lives in symbiotic relationship with microorganisms.
- Arguments for pasteurization are based on a discredited medical paradigm.

A6 MONDAY, JUNE 5, 2006

SCIENCE

THE WASHINGTON POST

Legion of Little Helpers in the Gut Keeps Us Alive

By RICK WEISS
Washington Post Staff Writer

So you think you are the self-reliant type. A rugged individualist.

Well, give it up. You'd be nothing without the trillions of microbial minions toiling in your large intestine, performing crucial physiological functions that your highfalutin human cells wouldn't have a clue how to do.

That's one of the humbling truths emerging from the most thorough census yet of the bacterial tenants homesteading in our bodies. The new view, made possible by cutting-edge DNA screening methods, shows that the vaunted human genome — all the genes in our cells — is but a fraction of what it takes to make a human.

In fact, it's time to stop thinking of yourself as a single living thing at all, say the scientists behind the new work. Better to see yourself as a "super-organism," they say: a hybrid creature consisting of about 10 percent human cells and 90 percent bacterial cells.

"The numbers might strike fear into people, but the overall concept is one we have to understand and adjust to," said Steven Gill, a microbial geneticist who helped lead the study at the Institute for Genomic Research in Rockville.

A better understanding of the bacteria colonizing our bodies could have far-reaching medical implications. In the not-too-distant future, Gill and others predicted, doctors will test for subtle changes in the numbers and kinds of microbes in people's guts as early indicators of disease. Doctors may prescribe live bacterial supplements to bring certain physiological measures back into normal range. And drug companies will invent compounds that mimic or amplify the actions of helpful bacteria.

"These microbes are master physiological chemists," said Jeffrey I. Gordon of Washington University in St. Louis, another team member. "Understanding their biosynthetic capabilities and following the pathways by which they operate could be the starting point for a 21st-century pharmacopoeia."

Scientists have long recognized that the number of human cells in the body is dwarfed by the 100 trillion or so bacteria living in and on it. It's a daunting reality obscured by the fact that human cells are much bigger than bacterial cells. For all their numbers, bacteria account for only about three pounds of the average person's weight.

Just how important those three pounds

are, however, has been difficult to appreciate until now. Most bacteria are too finicky to grow in laboratory dishes. As a result, little was known about who these majority shareholders really are and what, exactly, they are doing to and for us.

The new study, described in last week's issue of the journal *Science*, took a novel approach. Rather than struggling to grow the body's myriad microbes and testing their ability to perform various biochemical reactions — the methods scientists traditionally use to classify bacteria — the team used tiny molecular probes resembling DNA Velcro to retrieve tens of thousands of snippets of bacterial DNA from smidgens of the intestinal output of two volunteers.

By comparing the DNA sequences of those snippets with those of previously studied bacteria, the team was able to sort many of the invisible bugs into known families.

Hundreds of others, it became clear, belong to microbial families unknown to science until now.

But the team members went further. By comparing the genetic puzzle pieces with similar sequences stored in databases, they were able to determine what biological functions many of these microbes are performing in the gut. And, as it turns out, no small number of those functions are crucial to human survival.

Some of the bacteria have the genetic machinery to make essential vitamins that are not found in the diet and that human cells can barely manufacture, including several B vitamins. Others make enzymes that can break the chemical bonds in plant fibers, or polysaccharides, where a plant's nutritional energy is stored.

"We have very few of those linkage-breaking enzymes encoded in our own genome, but these microbial genomes have a whole arsenal of gene products to degrade plant polysaccharides to energy," Gordon said.

Some bacteria in the gut break down flavonoids and other chemicals made by plants that could cause cancer or other illnesses if they were not neutralized in the intestines.

Others have the genetic capacity to scavenge hydrogen gas from the gut — a by-product of digestion that can kill helpful bacteria — and convert it into methane. That makes the intestines a more biologically friendly place, while contributing in sometimes embarrassing moments to Earth's accumulation of greenhouse gases.

And in one especially touching example, bacteria in the gut make generous quantities of an enzyme that facilitates the produc-

tion of butyryl coenzyme A, a fatty acid that is a favorite food of the cells that line the colon.

"We provide them a great place to live," study author David A. Relman of Stanford University said of the bacterial cells, "and they are feeding the lining of our gut."

The new work does not purport to be a complete survey of all microbes in the human gut. And it did not even take a stab at the body's other pockets of microbial diversity — primarily the nose and mouth, the vagina, and the skin. But it demonstrates that the DNA-based approach has the potential to reveal at last the metabolic details of our many mini-mes, said Claire M. Fraser-Liggett, president and director of the Institute for Genomic Research.

With the technology improving and getting cheaper, she said, it won't be long before it is easy to monitor a person's microbial changes from day to day — or compare bacterial population structures among individuals who have different diets or health histories.

"One question we need to tackle is: Is there such a thing as a core microbiome, a set of organisms or bacterial genes you find in most or all individuals?" Fraser-Liggett said. "It may be that microbes are very stable and diet doesn't play a huge role. Or it may be that this is a snapshot in time reflecting something they ate in their last meal."

With that kind of information in hand, doctors could think about prescribing particular "probiotic" foods or supplements to change a patient's microbiome in healthful ways, or adjusting a patient's diet to make a better fit with the bugs that the patient is saddled with.

"To ignore our microbial side would be to ignore an important contributor to our health and our biology," Gordon said.

Edward DeLong, a professor at the Massachusetts Institute of Technology who has used similar techniques to study marine microbial diversity, said he was not completely comfortable with the idea that people are super-organisms. "I'm not sure where the super-organism ends and the environment begins," he said.

But he said he appreciated the focus on the positive side of bacteria.

"We typically think of microbes as being associated with human disease," DeLong said. "But they are always with us and are associated most of the time with human health."

Researcher Meg Smith contributed to this report.



ILLUSTRATION BY PATRICIA CLARE — THE WASHINGTON POST; STOCK PHOTO

Gut Bacteria: Our Essential Assistants

Five ways that intestinal microbes keep us alive, by doing what we can't:

- Vitamin synthesis, including several B vitamins.
- Breakdown of complex plant sugars to extract energy.
- Fermentation of dietary fiber.
- Conversion of hydrogen gas to methane.
- Breakdown of plant toxins that cause cancer and other diseases.

Medical Uses of Coliform Bacteria

- Reseeding of colon with fecal bacteria to combat diarrhea from overgrowth of *Clostridium difficile* after antibiotic treatment.
- *Lactobacillis* to combat rotaviruses that cause diarrhea and intestinal inflammation in children.
- *Streptococcus* nasal spray to combat pathogens that cause otitis media (ear infections).
- *Lactobacillis* to prevent *Staph. aureus* from colonizing wound sites.
- A harmless strain of *E. Coli* injected into the bladder to successfully combat urinary tract infections.

Food-Borne Illnesses Associated with Milk

A Comparison with Other Foods, 1997

Food	No. of Outbreaks	%	No. of Cases	%
Milk	2	0.4	23	0.2
Eggs	3	0.6	91	0.8
Chicken	9	1.8	256	2.1
Fruits/Vegetables	15	3.0	719	6.0
Salads	21	4.2	1104	9.2

**Milk, both pasteurized and raw,
has low rate of causing food-borne illness**

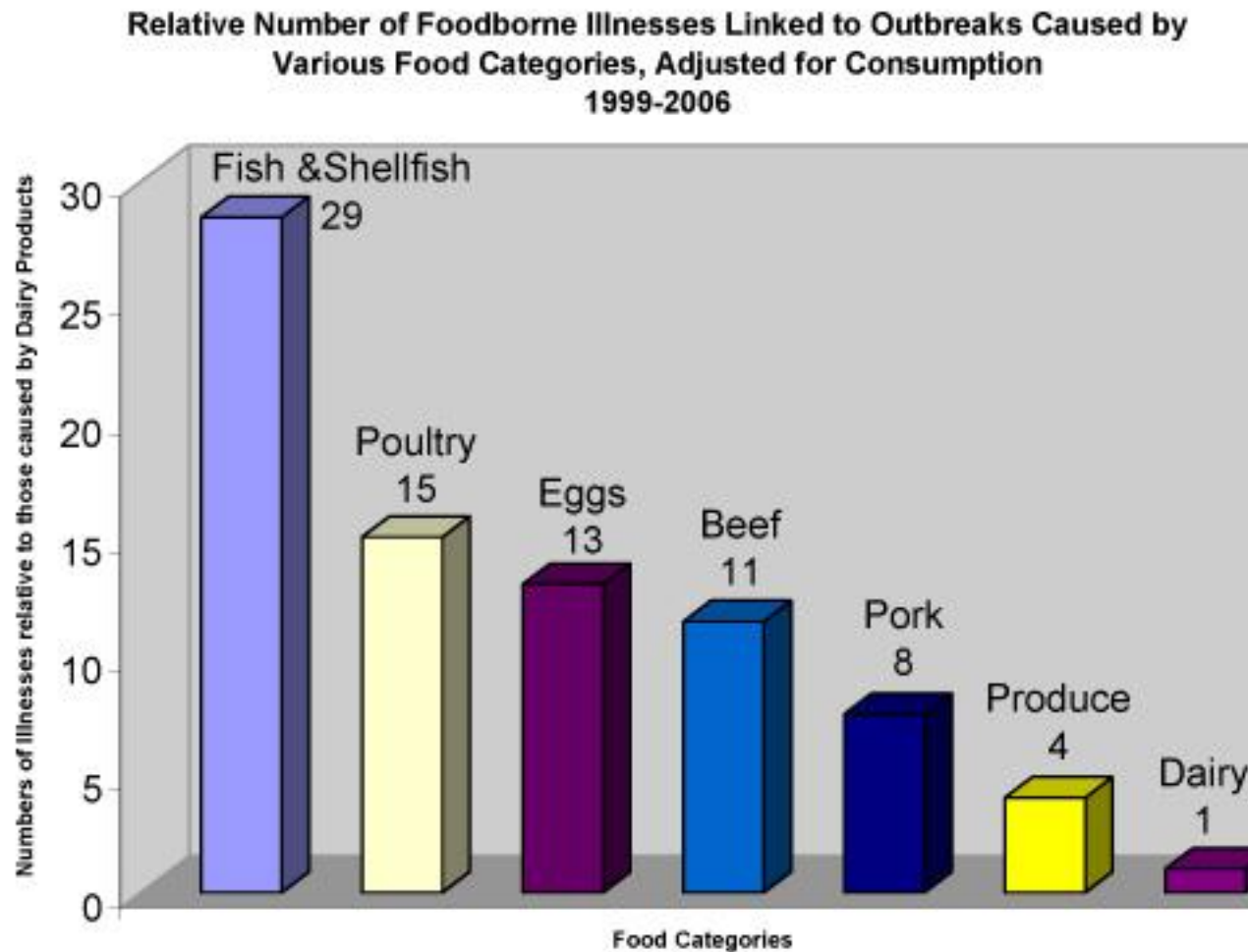
MMWR Mar 2, 2000;49(SS01);1-51

Food-Borne Illnesses 1990 - 2004

FOOD	NO. OF OUTBREAKS	%	NO. OF CASES	%
Produce	639	22%	31,496	38%
Poultry	541	18%	16,280	20%
Beef	467	16%	13,220	16%
Eggs	341	11%	11,027	13%
Seafood	984	33%	9,969	12%

Center for Science in the Public Interest

Food-Borne Illness 1999-2006



*Using the yearly average illnesses linked to Dairy outbreaks as the baseline

Campylobacter—Most Common Cause of Food-Borne Illness

While raw milk often gets the blame for food-borne illnesses, *Campylobacter* is the most common cause and is best known for contaminating meats.

Meats sampled for <i>Campylobacter</i> from 59 Washington, DC grocery stores during 1999-2000.		
	No. of Samples	% Positive
Chicken	184	70.7%
Turkey	172	14.5%
Pork	181	1.7%
Beef	182	0.5%

Applied and Environmental Microbiology, 2001:67(12):5431-5436

Listeria monocytogenes – Deadly food pathogen

- Raw milk is often blamed for causing infection with *Listeria Monocytogenes*, a deadly food pathogen that can cause severe illness and fetal death, premature birth or neonatal illness and death.
- In a 2003 USDA/FDA report: Compared to raw milk
515 times more illnesses from *L-mono* due to deli meats
29 times more illness from *L-mono* due to pasteurized milk
- On a PER-SERVING BASIS, deli meats were TEN times more likely to cause illness
- FDA: “Raw milk is inherently dangerous and should not be consumed.”
- Where are the FDA’s charges that deli meats are “inherently dangerous and should not be consumed? Where is the FDA’s exhortation to “everyone charged with protecting the public health” to “prevent the sale of deli meats to consumers”?

Interpretive Summary – Listeria Monocytogenes Risk Assessment,
Center for Food Safety and Applied Nutrition,
FDA, USDHHS, USDA, Sept. 2003, page 17

Listeria monocytogenes –

Not a Problem in Raw Milk

- In a response to a Freedom of Information Act request, the Centers for Disease Control provided data on raw milk outbreaks 1993-2005—a 13-year period.
- In this report, CDC listed NO cases of foodborne illness from raw milk caused by *Listeria* during the period.
- Recently the Pennsylvania Department of Agriculture (PDA) has suspended sales of several dairies and issued inflammatory press releases, claiming *Listeria monocytogenes* in the milk.
- Independent tests have shown NO *Listeria* in the milk and in all cases sales were resumed. There were no illnesses.
- Is the PDA trying to falsely build a case that *Listeria* is a problem in raw milk?

Raw Milk Challenge Tests I

- Large amounts of *Campylobacter* (an amount found in 20,000 grams manure) added to chilled raw milk (4° C):
- Most strains showed a dramatic decline
Day 0 = 13,000,000/ml
Day 9 = less than 10/ml
- The only stain that did not decline was a non-human strain.

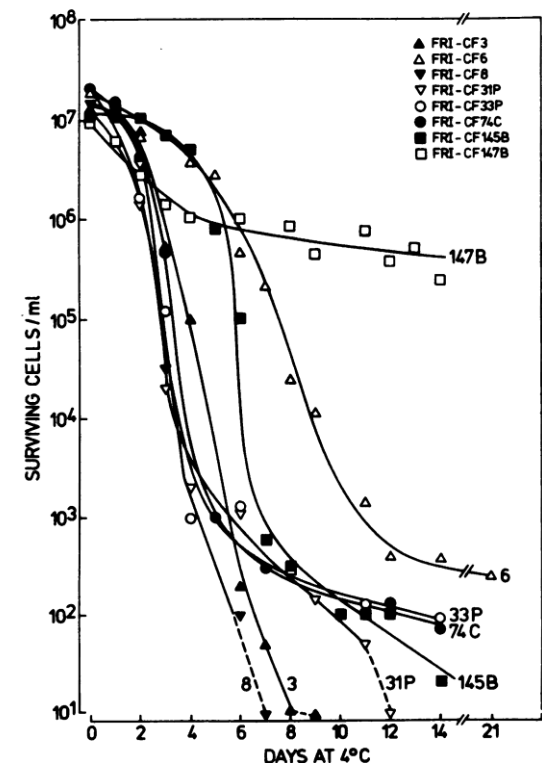


FIG. 1.
Survival of *C. jejuni* and NARTC in unpasteurized milk held at 4°C.
No campylobacters were detected at the <10-CFU/ml level
(minimum level of sensitivity) in the final sampling.

Raw Milk Challenge Tests II

- *Campylobacter* in raw milk at body temperature (37°C):
 - Bovine strains decreased by 100 cells/ml in 48 hrs.
 - Poultry strains decreased by 10,000 cells/ml in 48 hrs.
- The protective components worked more quickly to reduce levels of pathogens in warm milk than in chilled milk.

Mikrobiyolji Bul,1987:21(3):200-5

Raw Milk Challenge Tests III

- Lactoperoxidase in raw milk kills added fungal and bacterial agents^{1, 2}
- Raw goat milk kills *Campylobacter jejuni* in a challenge test³

1. *Life Sciences*, 2000;66(25):2433-9.

2. *Indian J Experimental Biology*, 1998;36:808-10.

3. *J. Food Protection*, 63: 916-920.

Raw Milk Challenge Tests IV

- Seven strains of *E. coli* O157:H7 in amounts of 1 million/ml added to raw milk. The pathogen failed to grow and died off gradually.¹
- *L. mono* added to raw milk at 98.6° F. After 56 hours, no viable cells of *L. mono* were detectible.²
- “The growth of *Staph. Aureus*, *S. Enteritidis* and *L. monocytogenes* in raw milk at 99° F was reduced markedly compared to the growth of these organisms in pasteurized milk.”³
- Five strains of *E. coli* O157:H7 did not grow at 41° F and decreased over days.⁴

1. *Letters in Applied Microbiology* 1999 28(1):89-92

2. *Australian Journal of Dairy Technology* 1999 54(2):90-93

3. *Milchwissenschaft* 2000 55(5):249-252

4. *Journal of Food Protection* 1997 60(6):610-613

Raw Milk Challenge Tests V

- BSK Food & Dairy Laboratories (2002) inoculated raw colostrum and raw milk samples at 40° F from Organic Pastures Dairy (Fresno, California) with a cocktail containing 2.4 million *Salmonella*, 9.2 million *E. coli* O157:H7 and 8.1 million *Listeria monocytogenes* (these huge amounts a very unlikely occurrence in a real-life situation).
- Yet even with these huge amounts, pathogen counts declined over time and in some cases were undetectable within a week.
- *E.coli* O157:H7 did increase slightly after seven-days decline, possibly due to exhaustion of anti-microbial components in the milk.
- The laboratory concluded: “Raw colostrum and raw milk do not appear to support the growth of *Salmonella*, *E. coli* O157:H7 or *Listeria monocytogenes*.”

McAfee, M. Unpublished data.

Raw Milk from Conventional Dairies – Not Recommended

Even though populations of pathogens are reduced and even eliminated when added in very large quantities to raw milk, we do NOT recommend consumption of raw milk from confinement dairies.

Under extreme conditions, the multiple anti-microbial components of raw milk may be overwhelmed.



The Money that Pays for Our Food Is a Source of Pathogens

- *E. Coli* has been shown to survive on coins for 7-11 days at room temperature.
- *Salmonella enteritidis* can survive 1-9 days on pennies, nickels, dimes and quarters.
- *Salmonella enteritidis* can also survive on glass and Teflon for up to 17 days.

Soy Products Contain Pathogens

- 1998 survey looked at four brands of soy milk; five types of microorganisms found in stored soy milk samples. During storage at 5°C, microbial counts increased sharply after 2-3 weeks.¹
- 1978 survey found *Salmonella* in many “health food” products, including soy flour, soy protein powder and soy milk powder. “The occurrence of this pathogen in three types of soybean products should warrant further investigation of soybean derivatives as potentially significant sources of *Salmonella*.”²

1. *J Food Protection*, 1998; 61(9):1161-1164.

2. *Applied & Environmental Microbiology*, Mar 1979; 37(3):559-566.

Pathogens in Pasteurized Orange Juice

- The FDA has ruled that all juice should be pasteurized, because raw juice might be a source of pathogens.
- Yet researchers have found fungus that is resistant to pressure and heat in processed fruit juices.
- One study found that 17% of Nigerian packages of orange juice and 20% of mango and tomato juices contained heat resistant fungi.¹
- Researchers also found *E. coli* in the orange juice that was pressure resistant and had survived pasteurization.²
- In one study, heat-treated and acid-hydrolyzed orange juice was tested for mutagenic activity. The authors hypothesized that the heating process produces intermediate products, which under test conditions, give rise to mutagenicity, and cytotoxicity.³
- In another study, gel filtration and high performance liquid chromatography were used to obtain mutagenic fractions from heated orange juice.⁴

1. Int J Food Sci Technology Oct 1995 30(5):587-590.

2. J Food Prot 1999 Mar 62(3):277-9.

3. Food-Chem 1989 31(4):289-294.

4. Food-Chem 1993 46(1):77-79.

Breast Milk Contains Pathogens

- **MISCONCEPTION:** Until recently, the medical profession claimed that breast milk was sterile.
- **PATHOGENS:** We now know that breast milk contains pathogens, often at very high levels.
- **IMMUNITY FOR LIFE:** The bioactive components in milk program the baby to have immunity for life to any pathogens he comes in contact with.
- **PASTEURIZE BREAST MILK?** Should mothers be required to pasteurize their own milk before giving it to their babies?
- **DISCRIMINATION:** Laws prevent mothers from obtaining raw milk to feed their babies should their own supply be inadequate.

1. *J Appl Microbiol.* 2003;95(3):471-8.
2. *Neonatal Netw.* 2000 Oct;19(7):21-5.
3. *J Hosp Infec.* 2004 Oct;58(2):146-50.
4. *Curr Med Chem.* 1999 Feb;6(2):117-27.
5. *Scientific American*, December 1995.
6. *Lancet.* 1984 Nov 17;2(8412):1111-1113.
7. *Cent Afr J Med.* 2000 Sep;46(9):247-51.
8. *Eur J Pediatr.* 2000 Nov;159(11):793-7.
9. *J Dairy Sci* 1991;74:783-787.

Pasteurization Reduces Protective Effects of Breast Milk

1984 study involving high-risk premature infants

Type of Milk	Rate of infection
Pasteurized human milk + formula	33.0%
Raw human milk + formula	16.0%
Pasteurized human milk	14.3%
Raw human milk	10.5%

Lancet. 1984 Nov 17;2(8412):1111-1113

Pasteurizing Breast Milk Puts Infants at Risk!

A recent outbreak of *Pseudomonas aeruginosa* in a neonatal intensive care unit caused by a contaminated milk bank pasteurizer resulted in 31 cases of infection and four deaths.

Arch Dis Child Fetal Neonatal Ed, 2003 Sep;88(5):F434-5.

Some Outbreaks Due to Pasteurized Milk

- 1976—1 outbreak *Y. enterocolitica* in **36** children, 16 of whom had appendectomies, due to pasteurized chocolate milk¹
- 1982—172 cases, 100 hospitalized, *Y. enterocolitica* in several states from milk produced in Memphis, TN²
- 1983—1 outbreak, **49** cases, **14 deaths** from *L. monocytogenes* in MA²
- 1984-85—3 outbreaks of antimicrobial-resistant *S. typhimurium*, at plant in Melrose Park IL. The third wave had **16,284** confirmed cases; surveys indicated as many as 197,581 persons may have been affected²
- 1985—**1,500+** cases, *Salmonella* culture confirmed, in Northern IL²
- 1993-94—1 outbreak, **2014** cases/**142** confirmed *S. enteritidis* due to pasteurized ice cream in MN, SD, WI⁶
- 1995—Outbreak of *Yersinia enterocolitica* in **10 children**, 3 hospitalized due to post-pasteurization contamination⁷
- 2000—1 outbreak, **98** cases/**38** confirmed *S. typhimurim* in PA and NJ⁸
- 2005—1 outbreak, **200** cases *C. jejuni* in CO prison⁹
- 2006—1 outbreak, **1592** cases/**52** confirmed *C. jejuni* infections in CA¹⁰
- 2007—1 outbreak, **3 deaths** from *L. monocytogenes* in MA.¹¹
- 2009—1 outbreak, **7 deaths** from pasteurized milk cheese in Europe.

Milk Safety in California

- **ORGANIC PASTURES:** Since 1999, over 40 million servings of Organic Pastures raw milk, not one confirmed illness; in over 1,300 tests, not one proven illness and no pathogens found in the milk or milking area, or in any of the dairy cows being milked on the farm.
- **CLARAVALE:** In Claravale Farm's 80-year history, no consumers of their milk have ever gotten sick from milk-borne pathogens and no pathogens have ever been detected in the milk.
- **PASTEURIZED OUTBREAKS:** Since 1999, several pasteurized milk products recalled and one publicized outbreak of illness due to pasteurized milk during the same period, an outbreak of *Campylobacter* that sickened 1,300 inmates in 11 state prisons.

Bias in Reporting Safety of Raw Milk I

- 1983 OUTBREAK of *Campylobacter* infection in Atlanta, GA blamed on raw milk.
- EXTENSIVE TESTING failed to find *Campylobacter* or any other pathogens in any milk products from the dairy. All safety measures had been followed faithfully.
- AUTHORS' CONCLUSION: "The only means available to ensure the public's health would be proper pasteurization before consumption."¹
- RAW MILK BANNED in Georgia as a result of this incident.

Am J Epidemiol. 1983 Apr;117(4):475-83.

Bias in Reporting Safety of Raw Milk II

- OUTBREAK: November 2001 outbreak of *Campylobacter* in Wisconsin blamed on raw milk from a cow-share program in Sawyer County. The farm has an outstanding safety record.
- OFFICIAL REPORT: 75 persons ill.¹
- INDEPENDENT REPORT: Over 800 ill during 12 weeks following Nov 10, 2001.
- HAMBURGER LIKELY CAUSE: Only 24 of 385 cow-share owners became ill. Most had consumed hamburger at a local restaurant. No illness in remaining 361 cow-share owners.
- BIAS: Local hospitals tested only those who said they had consumed raw milk; others sent home without investigation, so mostly raw milk drinkers included in report.
- LAB TESTS CLEAN: Independent lab tests found no *Campylobacter* in the milk.²

1. MMWR 2002 JUN 28;51(25):548

2. http://www.realmilk.com/pr_071402.html

Bias in Reporting Safety of Raw Milk III

- CDC REPORT: In 2002, an outbreak of *Salmonella Typhimurium* implicated raw milk purchased at a dairy producing certified milk in Ohio.¹
- SOURCE NOT DETERMINED: According to the CDC: “The source for contamination was not determined; however, the findings suggest that contamination of milk might have occurred during the milking, bottling or capping process.”
- MANY POSSIBLE SOURCES: There were many possible of vectors of illness on the dairy besides raw milk.
- COINCIDENCE? The outbreak came just a week after the Ohio Farm Bureau Federation voted in favor of raw milk.
- NO MORE RAW MILK SALES: The dairy, which had been in business for decades without incident, caved in to health department pressure.

1. MMWR 2002 JUN 28;51(25):548

2. http://www.realmilk.com/pr_071402.html

Bias in Reporting Safety of Raw Milk IV

- VANCOUVER ISLAND, five children from different families were diagnosed with an infection of *E.coli* O157:H7 after drinking raw goat's milk¹
- BIAS: The report provides an excellent example of bias. The title, "*Escherichia Coli* O157 Outbreak Associated with the Ingestion of Unpasteurized Goat's Milk in British Columbia, 2001" does not reflect the possible sources of infection presented in the report.
- SAMPLES: One milk sample found "presumptively" positive after "enrichment" with a testing substance; no *E.coli* found in samples before "enrichment"; no *E.coli* found in second sample.
- OTHER SOURCES: First child infected had also visited a petting farm (a common source of infection); all children lived on a cooperative farm (where contact with animals was a possible source of infection.) *E. coli* O157:H7 in water a huge problem in the nearby state of Washington due to run-off from industrial farms. *E. coli* infection usually comes from hamburger meat.

Canada Communicable Disease Report, 2002 JAN 01; 28-01(01)

Bias in Reporting Safety of Raw Milk V

- North Carolina, 10/2000 – 1/2001, Outbreak of Listeriosis Associated with Homemade Mexican-Style Raw Cheese *MMWR* July 06, 2001 50(26);560-2; MacDonald and others. *Clin Infect Dis.* 2005;40(5):677-82
- Results probably biased as “During the study, rumors spread that the suspected vehicle of infection was homemade Mexican-style cheese.”
- Case patients were almost five times as likely as controls to have eaten hot dogs. The outbreak occurred during a massive recall of *Listeria*-infected hotdogs (900,000 pounds of hotdogs) in 10 southeastern states.
- Raeford Farms barbequed chickens were also recalled at time of outbreak—the company refused to comply with the recall!
- *Listeria* was present in the bulk tank raw milk of a manufacturing-grade dairy equipped only to produce process dairy products; bulk tank raw milk from dairies equipped to sell milk as a beverage did not contain the organism.
- Revised milking procedures focusing on thorough cleaning of teats and equipment got rid of *Listeria* contamination at the manufacturing-grade dairy.
- NO PASTEURIZATION WAS NECESSARY to prevent contamination with *Listeria*.
- Raw milk was made a well-publicized whipping boy for widespread contamination problems in other foods.

Bias in Reporting Safety of Raw Milk VI

- Virulent *E. coli* O157:H7 sickens up to 20,000 per year in US and kills several hundred.
- Recent outbreak in California traced to contaminated spinach.
- California officials blamed illness in 4 children during spinach outbreak on raw milk from Organic Pastures Dairy. Ordered quarantine of all OP raw milk products.
- After extensive testing, no *E. coli* O157:H7 found in OP raw dairy products. Quarantine lifted. OP Dairy paid compensation.
- FDA blames illnesses on OP raw milk in slides 56-59 of anti-raw milk PowerPoint.
- FDA removes slides after letter from OP president Mark McAfee, who points out errors and reminds FDA officials that they are breaking food liability laws.
- Officials still refer to this incident as though OP were to blame.

Slides Removed by FDA

- FDA removed these erroneous slides after protest by Organic Pastures Dairy
- Only two children were hospitalized; they were given antibiotics, which is contra-indicated for *E. coli* O157:H7 because it leads to HUS.
- No pathogens were found in the milk or on the farm, except for in three heifers that were not being milked, and this was of another strain than that which caused the illness.
- California Department of Farms and Agriculture made a payment to compensate the dairy for lost business.

Recent Outbreaks - California

- California Outbreak
 - Onset 9/6, 9/13/06
 - 4 Patients
 - 4 Hospitalized
 - 4 Hemolytic Uremic Syndrome (HUS)
 - HUS can cause kidney failure and death
 - *E. Coli* O157:H7

Recent Outbreaks - California

- 4 children ill;
- An 8-year-old San Diego County girl, a Riverside County boy, 7, and a 10-year-old girl in San Bernardino County got sick after drinking contaminated milk.
- Case B (8 year old boy, SDC key id 07-015191) was confirmed as being associated with consuming the recalled brand of organic raw milk. He consumed the milk on 9/8 at the home of a friend, and his (Case B) onset was 9/13.

Techniques for Blaming Raw Milk

- When testing raw milk, use cultures to promote pathogen multiplication and highly sensitive milk testing techniques that find pathogens in extremely small numbers, levels that would not cause illness. (Any substance you test will show pathogens if the test is sensitive enough.)
- Use new rapid testing techniques developed for the food industry that err on the side of finding false positives.
- When there is an outbreak, use food questionnaires that leave out likely vectors of disease but ALWAYS include raw milk.
- When there is an outbreak, test raw milk products first, and test open containers in the home setting rather than from the shelf. If a person is infected and has handled a raw milk product, the product may test positive for the organism. Omit testing other foods or raw milk products on the shelf (not handled by the consumer) but report a positive lab result for the opened container of raw milk product.
- Omit subjects who got sick but did not drink raw milk.
- Ignore equally likely or more likely sources of infection, such as visit to a farm or petting zoo, tap water or other foods.
- Assume that statistical association constitutes proof. It is easy to create a statistical association with raw milk using the above techniques.
- Issue inflammatory press releases accusing raw milk, which are not retracted when the dairy is exonerated.

Mis-Information & Dis-Information about Raw Milk

- FALLACY OF THE MODERN: Rejection of anything “old” without examination of the details, such as dismissing scientific studies from the 1920s through the 1940s (or even the 1980s) “old science,” as if “old” equals “untrue.”
- BROAD BRUSH: For example, claiming that raw milk may harbor a host of disease-causing organisms (pathogens), such as *tuberculosis*, the bacteria *Campylobacter*, *E. coli* 157:H7, *Listeria*, *Salmonella*, *Yersinia* and *Brucella*.”
- CROSS ATTRIBUTION: Associating “listeria” with “drinking raw milk” when it is related to soft cheeses.* Used to magnify and concentrate the effect.
- OVERGENERALIZING OR LUMPING: Implying that all serotypes, genotypes, strains, forms, serovars, virotypes, varieties and isolates of a genus or species are pathogenic when in fact many are neutral or beneficial. Has the affect of automatically generating positive test results.
- ETIOLOGY IN A VACUUM: Separating the cause & effect relationship from the surrounding conditions (such as blaming raw milk when bad water or exposure to animals is a likely cause). Conjures a mystical fatalism in which the presence of a pathogenic micro-organism is somehow “inherently” dangerous under all conditions.
- EITHER-OR REASONING(usually to extremes): Either Raw Milk is a dire threat to public health and must be banned or it must be mass-produced and sold on store shelves at Wal-Marts everywhere. Usually, there are other, and better alternatives to either choice.

Double Standard for Pasteurized Milk

- Feb 24, 2006, Wal-Mart in Vidalia Georgia pulls pasteurized milk from shelves due to foul odor.
Foodconsumer.org 28 Feb 06
- At least one child seriously sick, not reported in news release. Private communication.
- Voluntary recall announced Feb 27, three days later – no sense of urgency.
- Wal-Mart applauded by Commissioner Tommy Irvin.
- No government recalls; no warnings to the public to avoid drinking pasteurized milk.

Risky Behaviors? More Double Standards

- FDA calls drinking raw milk “risky behavior.”
- 1999 FDA Survey, 19,356 adults, 8 states. *Am J Prev Med* April 16(3):312-221
 - 50% consumed uncooked eggs
 - 20% consumed pink hamburgers
 - 8% consumed raw oysters
 - 1% consumed raw milk
- 2008 Study of 4,548 young college students. *J Am Dietetic Assoc* 108:549-552
 - 53% consumed raw cookie dough
 - 33% consumed eggs with runny yolks
 - 29% consumed raw sprouts
 - 11% consumed raw oysters, clams or mussels
 - 7% consumed rare hamburger
 - Did not report raw milk consumption
- None of the common “risky behaviors” has prominence on FDA’s website for food safety, but raw milk does.
- No pasteurization requirement for common “risky behavior” foods.

FDA Powerpoint Warning Against Raw Milk

Posted at www.cfsan.fda.gov/~ear/milksafe, John F. Sheehan, Director, Division of Plant and Dairy Food Safety, contends that pasteurization is the only way to ensure the safety of milk. Of the 15 studies referenced:

No Valid Positive Milk Sample	12/15	80%
No Valid Statistical Association with Raw Milk	10/15	67%
Findings Misrepresented by FDA	7/15	47%
Alternatives Discovered, Not Pursued	5/15	33%
No Evidence Anyone Consumed Raw Milk Products	2/15	13%
Outbreak Did Not Even Exist	1/15	13%
Did Not Show that Pasteurization Would Have Prevented Outbreak	15/15	100%

Source: Response to the FDA, www.realmilk.com

William Marler Anti-Raw Milk Paper

Cites 102 papers alleging illness caused by raw milk. 32 were either about illnesses from pasteurized milk or editorials in favor of raw milk! Of the remaining 70:

Either no valid positive milk sample or no valid statistical association	67/70 (96%)
No valid positive milk sample	56/70 (80%)
No valid statistical association with raw milk	43/70 (61%)
Neither association nor milk sample	35/70 (50%)
No evidence anyone consumed raw milk products	7/70 (10%)
Statistical associations with other factors discovered but not pursued	4/70 (6%)
Did not show that pasteurization would have prevented outbreak	65/70 (93%)

CDC Raw Milk “Outbreaks,” 1998-2005

Sloppy table consisting of reports, news items, press releases. Report summary claims “831 illnesses, 66 hospitalizations, one death.” (foodsafety.ksu.edu/articles/384/RawMilkOutbreakTable.pdf)

None of the reports mentions any death!

Either no valid positive milk sample or no valid statistical association	31/33 (94%)
No valid positive milk sample	27/33 (82%)
No valid statistical association with raw milk	26/33 (78%)
Neither association nor milk sample	21/33 (64%)
Did not provide evidence that pasteurization would have prevented outbreak	32/33 (97%)
Evidence that pasteurization would not have prevented outbreak	32/33 (97%)
Outbreak traced to pasteurized milk	1 (2 reports)
Outbreak traced to pasteurization failure	1 (cited twice)
Source of Information unpublished or not verifiable	3

Comparative Safety of Raw Milk I

Based on statistics compiled by Dr. Ted Beals

- 42 government-reported illnesses from raw milk per year for the period 1999-2011. This number includes unconfirmed cases.
- According to a 2007 CDC survey, there are about 9 million raw milk drinkers in the US (3.04% of population). (This number is probably higher today.)
- Rate of illness from raw milk can be calculated at .00046%. The actual percentage is probably much lower.
- There are about 48,000,000 confirmed cases of foodborne infections per year in the US.
- Population about 300,000,000
- Rate of illness from all foods can be calculated at 16%
- Thus, you are at least 35,000 times more likely to contract illness from other foods than from raw milk. PLUS, drinking raw milk protects you against illness from other foods!

Source: <http://www.realmilk.com/real-milk-pathogens.html>

- **Comparing Raw Milk to Other Foods:** Between 1998 and 2005, there were over 10,000 documented outbreaks that contributed to 199,263 documented cases of foodborne illness.
- Raw milk was associated with 0.4 % of these cases, a number that is probably exaggerated.
- There is no way to quantify whether any one of these foods is safer than another from this data, but it is clear from the data that there is no basis for singling out raw milk as “inherently dangerous.”

realmilk.com/documents/SheehanPowerPointResponse.pdf.

Raw Milk Production Today

Compared to 30-50 years ago, dairy farmers today can take advantage of many advancements that contribute to a safe product:

- Managed rotational grazing, ensures healthy cows
- Understanding of and effective testing for all zoonoses (diseases that cross-infect from animals to humans)
- Understanding of how water-borne pathogens get into bulk milk and control measures. Effective cleaning systems.
- Refrigerated bulk tanks
- Refrigerated transportation
- Easier and inexpensive milk testing techniques

Swill Milk

- During 1800s, the death rate was 50% among urban children drinking “Swill Milk,” that is, milk produced in inner city confinement dairies, from cows fed brewery swill and raised in unimaginable filth. Called “The Milk Problem.”
- Water (usually from a well or dam) was often added to milk to make it go further; chalk was sometimes added.
- Called “the oldest food fraud” in 1860 and still a problem today. There is a case before the courts in Australia of water deliberately added to milk in 2007!

Schmid, Ron, *The Untold Story of Milk*, NewTrends Publishing.

The Campaign Against Raw Milk

- Mandatory pasteurization first proposed by Abraham Jacobi, known as the father of American pediatrics
- Left Berlin for NY after being jailed two years for high treason during political turmoil of the early 1850s; a socialist who corresponded with Karl Marx.
- Fought the notion that raw milk was safe for infants.
- Worked to convince a skeptical public that heating milk until bubbles appeared would save lives.
- Biggest promoter of pasteurization was his close friend and fellow German émigré, Nathan Straus, owner of Macy's. Invented phrase "Raw Milk Can Kill."
- 1892, Straus opened the Straus Pasteurized Milk Laboratory and soon introduced the first low-cost milk depots for the city's poor.
- Early arguments for pasteurization always admitted that certified raw milk was also acceptable. Pasteurized and raw milk coexisted for over 50 years.

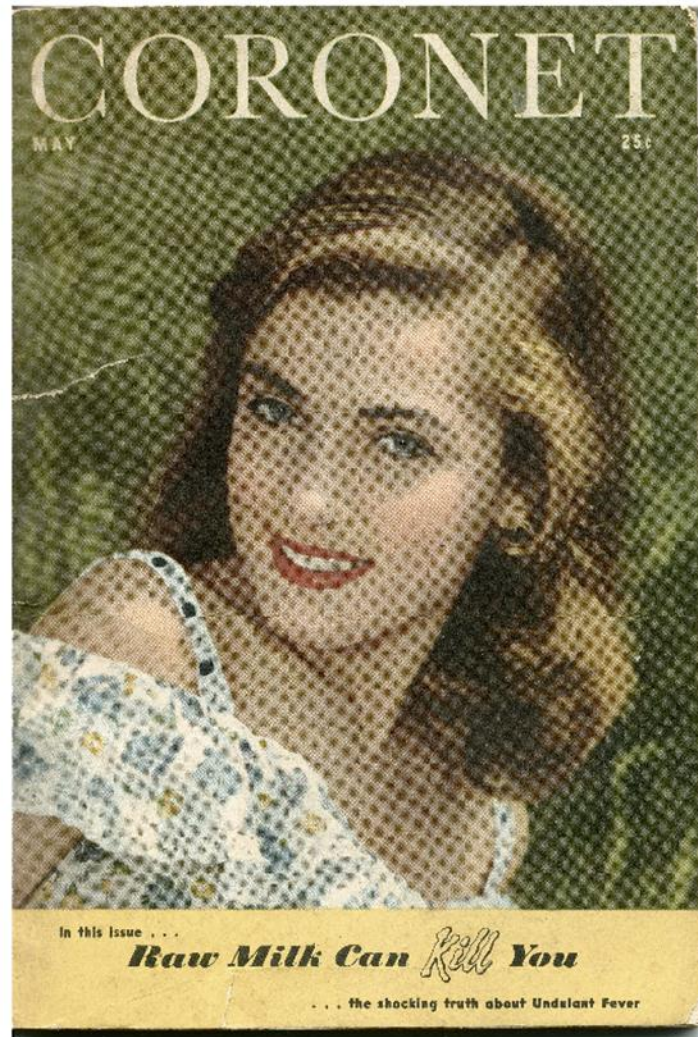
1910 New York Milk Committee Conference

- Goal: to reach a consensus on how to handle the city's dairy products
- Most participants were opposed to pasteurization and considered certified raw milk superior.
- But city officials did not think they could afford the necessary inspection force to safeguard raw milk.
- Result: the Committee endorsed pasteurization because “Private companies, particularly larger companies, through their capital investment in pasteurizing technology, would enable the state to supply the guarantee of milk safety without imposing further public costs.
- Decision had nothing to do with science, only with fiscal expediency.

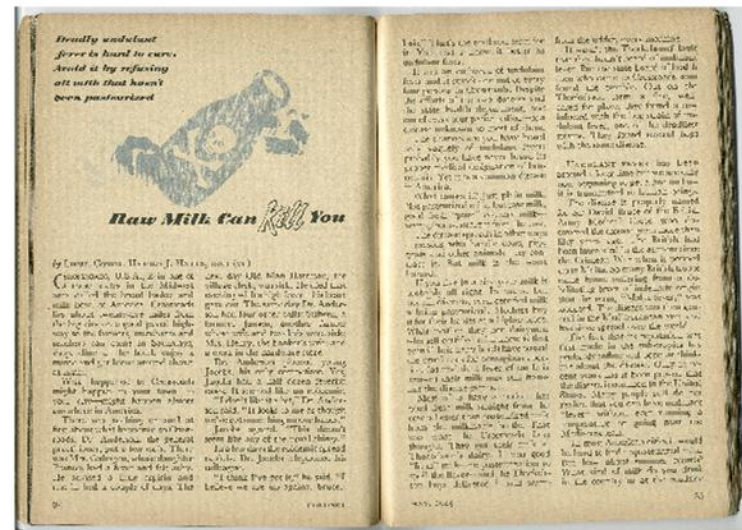
Source Nature's Perfect Food: How Milk Became America's Drink by Erna DuPuis

The Campaign Against Raw Milk II

Coronet Magazine, May 1945



- Article in *Coronet Magazine*, May, 1945
- Seemingly factual article about a town called Crossroads, USA, where many died from undulant fever, contracted from raw milk
- One small problem: the whole story was made up, there was no Crossroads, USA, and no outbreak of undulant fever!



August, 1946, *Reader's Digest* repeated false story about Crossroads, USA



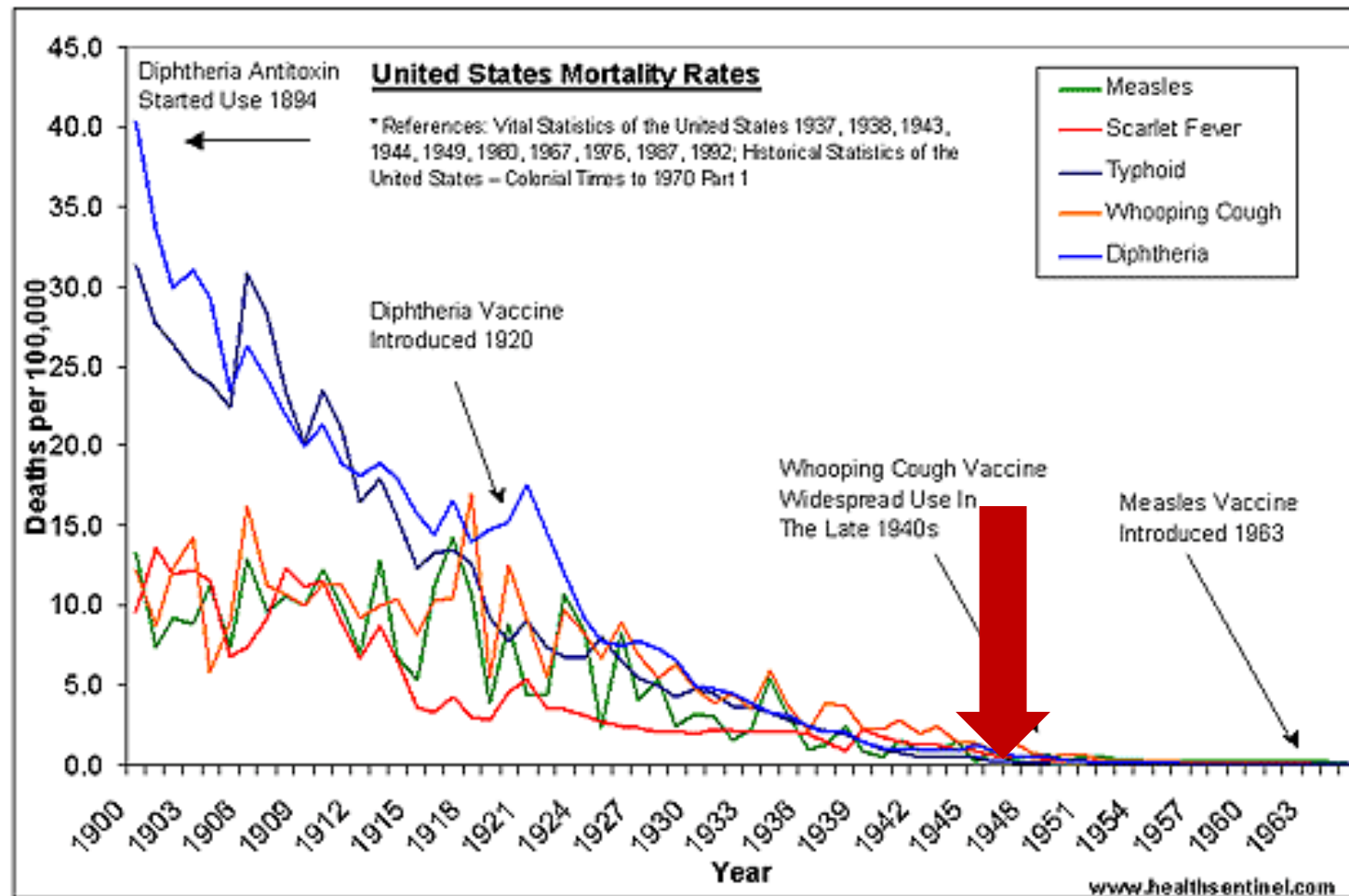
Solution to the “Milk Problem”

The “Milk Problem” was solved by:

- Outlawing inner city swill dairies
- Improved hygiene
- Improved water treatment
- Replacement of the horse with the car
- The Certified Raw Milk movement
- Increased consumer access to refrigeration

...NOT by milk pasteurization laws

Decline of Infectious Disease Not Related to Mandatory Pasteurization



1948: First State Mandatory
Pasteurization Laws

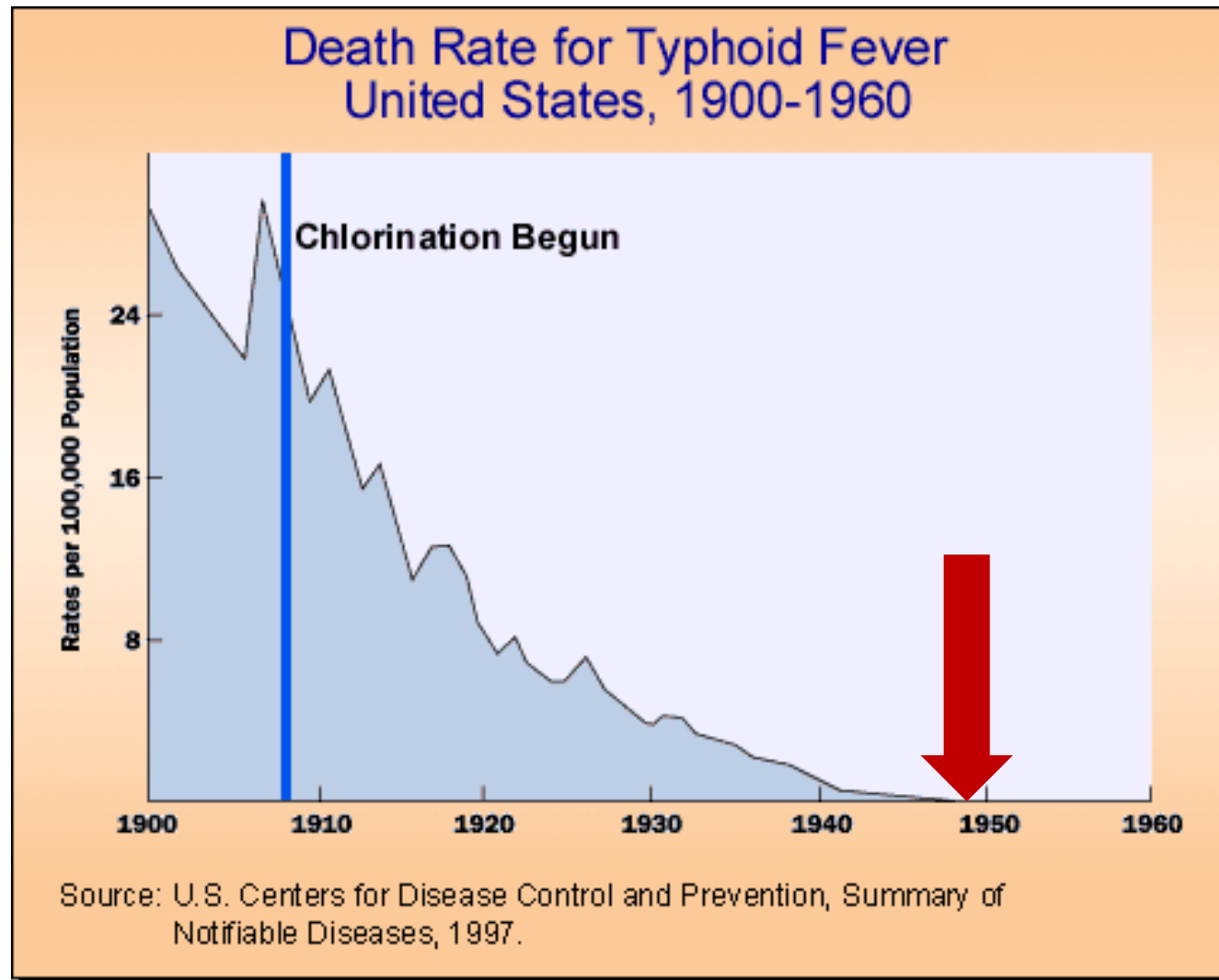
Raw Milk or Bad Water?

CHICAGO STUDY: Study of decline in Chicago mortality rates, 1850-1925, looked at three factors:

1. Milk Laws: 1893, began inspections to ensure milk had enough fat; 1908, law that milk must be pasteurized or certified pathogen-free.
2. Introduction of diphtheria anti-toxin in 1895
3. Improvement in water sanitation: 1893 closure of shoreline water intakes; 1900 opening of Chicago Drainage Channel.

CONCLUSION: The introduction of pure water explains 30-50% of Chicago's mortality decline; other interventions had much smaller effects.

Raw Milk or Bad Water??



1948: First State Mandatory
Pasteurization Laws

Heat-Resistant Pathogens in Pasteurized Milk

- Johne's bacteria (paratuberculosis bacteria)– suspected of causing Crohn's disease, now routinely found in pasteurized milk (19% of samples tested).¹
- *B. Cereus* spores, Botulism spores and Protozoan parasites survive pasteurization.²
- *Listeria monocytogenes* and *E. coli* O157:H7 survive HTST pasteurization; various *Bacillus* and *Clostridium* species may also survive pasteurization.³
- Dormancy of heat-treated *E. Coli* can cause typical laboratory culture techniques to underestimate presence of *E. coli* in pasteurized milk 100-fold.⁴

1. *Appl & Environ Microbiol* 2002 May;68(5):2428-35

2. Elliott Ryser. Public Health Concerns. In: Marth E, Stelle J, eds. *Applied Dairy Microbiology*, New York, Marcel Dekker, 2001.

3. Binderova and Rysanek. *Veterinari Medicina*. 1999;44(10):301-308.

4. Gunasekera and others. *Appl Environ Microbiol*. 2002;68(4):1988-1993 (and references therein).

Modern Milk Production



Highly industrialized, with many possibilities for contamination in the feedlots, and during and after processing.



Harsh solvents must be used to clean miles of pipes in the processing plant; impossible to prevent residues from contaminating the milk.

Feedlot vs. Pastured Cattle

Studies show that factory-farmed cattle have 300 times more pathogenic bacteria in their digestive tracts than cattle that are allowed to openly graze in pastures.

Peck, John E. "Spinach Crisis Reflects Need For Smaller Farms,"
The Capital Times, A8, October 2, 2006

Summary of Raw Milk Safety

- **SAFEST FOOD:** Raw milk is safer than any other food. It is, after all, the only food suitable for the newborn, and the newborn has no immunity yet.
- **BUILT-IN SAFETY MECHANISMS:** Raw milk is the **ONLY** food that has built in safety mechanisms.
- **40-YEAR-OLD SCIENCE:** Claims that raw milk is unsafe are based on 40-year-old science.
- **COURT OF LAW:** Claims that raw milk is unsafe would not hold up in a court of law.
- **RUSSIAN ROULETTE?** Drinking raw milk from grass-fed animals is like playing Russian roulette--with no bullets in the chamber.

Ensuring Raw Milk Safety

- From pasture-fed cows
- Full fat
- Cows free of TB and undulant fever
- Milk produced under sanitary conditions
- Milk immediately placed in cold storage
- Regular testing program for somatic cell count and pathogens
- Regular testing of water on the farm.

Protective Components in Milk Fat

- Short and Medium Chain Fatty Acids: Disrupt cell walls of bad bacteria.
- Spingolipids: Bind to intestinal cells, prevent absorption of pathogens and toxins.
- Arachidonic acid: Helps build gut wall, skin and brain
- Fat-soluble vitamins A and D strengthen the immune system.
- Pasteurized reduced-fat milk 3-5 times more likely to cause diarrhea in children and the elderly than pasteurized whole milk (Koopman, J S, et al, *AJPH*, 1984, 74:12:1371-1373).
- People on lowfat diets tend to have weakened immune systems.
- Drink only raw WHOLE milk!!

Raw Milk Production Handbook

- Excellent resource for safe raw milk production

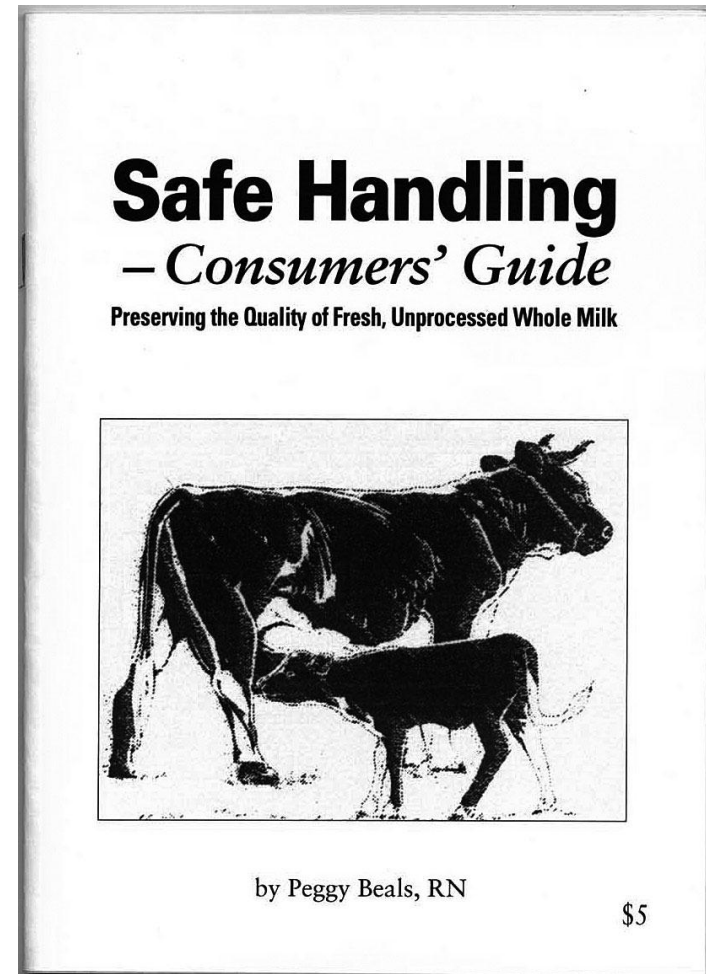


Raw Milk Production Handbook

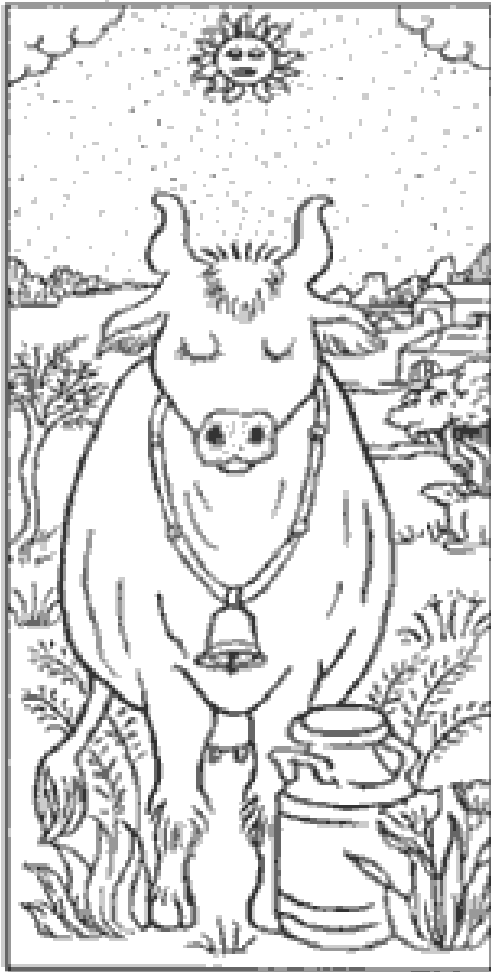


Raw Milk Safe Handling Consumers Guide

- Excellent resource for safe raw milk handling in the home



Part 2: Is Raw Milk More Nutritious?



“Research has shown that there is no significant difference in the nutritional value of pasteurized and unpasteurized milk.”

—John F. Sheehan, Director,
US Food and Drug Administration, Division of
Dairy and Egg Safety

FDA Consumer, Sept/Oct 2004

Proteins in Milk

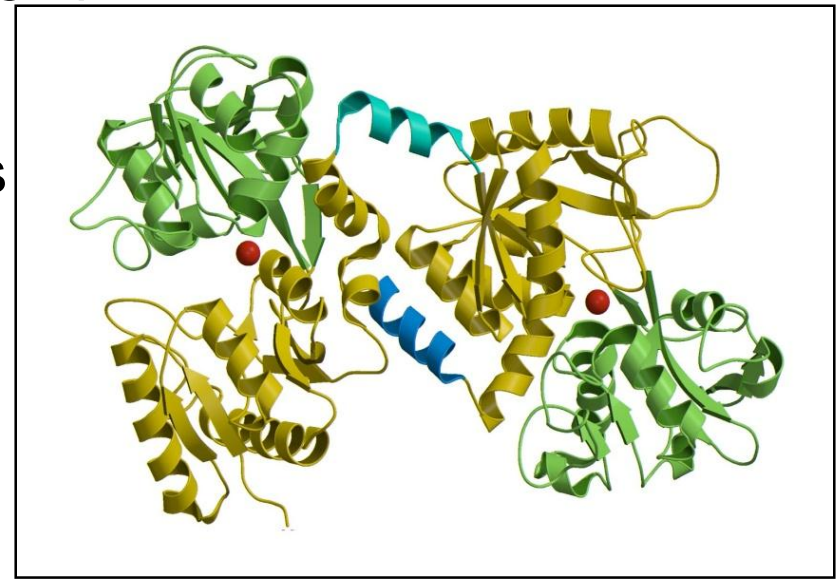
MILK PROTEINS: Three dimensional, like tinker toys, very fragile

CARRIERS: Carry vitamins and minerals through the gut into the blood stream; comprise enzymes; enhance the immune system; protect against disease

IMMUNE DEFENSE: Pasteurization and ultra-pasteurization flatten (de-nature) the three-dimensional proteins, destroying their biological activity; the body thinks they are foreign proteins and mounts an immune defense.

DISEASES: Immune attacks lead to juvenile diabetes, asthma, allergies and other disorders later in life.

ALLERGIES: More and more people unable to tolerate pasteurized milk; one of the top eight allergies; some have violent reactions to it.



Lactoferrin Molecule

Raw Milk and Children - 1926

STUDY: 224 Children at the Boston Dispensary were fed either:

- Raw Certified Milk, or
- Grade A pasteurized milk, or
- Grade A pasteurized milk plus cod liver oil, or
- Raw Certified Milk plus cod liver oil and orange juice

CONCLUSION: “The use of certified milk [raw] without orange juice or cod liver oil gave a considerably greater percentage of weight development than either pasteurized milk alone or pasteurized milk with orange juice and cod liver oil. . . A larger use of certified milk in infant feeding should be encouraged by the medical profession.

Arch Ped 1926 JUN; 43:380

Raw Milk and Calcium Assimilation - 1928

COMPARISON: Investigators compared calcium and phosphorus utilization from raw, pasteurized, evaporated and dried milks.

LESS FAVORABLE BALANCES: Researchers obtained “less favorable calcium balances” in adults with pasteurized milk than with “fresh milk.”

GRASS FED SUPERIOR: Milk from cows kept in the barn for five months gave less favorable calcium balances than did “fresh milk.”

Kramer MM and others. *Journal of Biological Chemistry*
1928;79:283-290

Raw Milk and Children - 1929

- COMPARISON of 2 groups of babies.
 - Group I (122 babies) received raw milk
 - Group II (112 babies) received pasteurized milk.
- WEIGHT GAIN was much better in group receiving raw milk
- RICKETS occurred more frequently in the group receiving pasteurized milk; cases of rickets in the raw milk group were milder.
- DIARRHEA
 - 24 cases with 9 deaths in raw milk group
 - 36 cases with 15 deaths in pasteurized milk group
- MORTALITY

Group I Raw Milk	10%
Group II Pasteurized Milk	16%

Raw Milk and Children – 1931

Bias in Reporting Health Benefits

STUDY: 20,000 poor children (ages 5-12) in Lanarkshire schools in Scotland, funded in part by individuals in the dairy industry.

THREE GROUPS: 5,000 given $\frac{3}{4}$ pint raw milk per day; 5,000 given $\frac{3}{4}$ pint pasteurized milk per day; 10,000 received nothing.

“NO DIFFERENCE”: Published final report (*Nature*, March 21, 1931) stated that those receiving milk had increase in rate of growth and that “the effects of raw and pasteurized milk on growth in weight and height are, so far as can be judged from this experiment, equal.”

“RAW MILK BETTER”: Bias caught by two scientists (Fisher and Bartlett) who published a critical evaluation of the original authors’ conclusions (*Nature*, April 18, 1931). Growth, especially in boys, was actually better in those receiving raw milk. “Pasteurized milk was only 66 percent as effective in the case of boys and 91 percent as effective in the case of girls in inducing increases in weight; and 50 percent as effective in boys and 70 percent as effective in girls in bringing about increases in height.”

Studies of Mattick and Golding - 1931

“Our results show definitely that some dietetic factors are destroyed when milk is sterilised, and to a definite but lesser degree when it is pasteurised, and that although fresh milk is capable of supporting sustained growth and reproduction in rats, heated milk is no longer capable of doing so.”

Mattick EC and Golding J. *The Lancet*. Mar 22, 1931, p 667.

Rat Studies of Scott & Erf - 1931

By Dr. Ernest Scott and Professor Lowell Erf,
Ohio State University, 1931

Whole Raw Milk	Good growth; sleek coats; clear eyes; excellent dispositions; enjoyed being petted.
Whole Pasteurized Milk	Rough coats; slow growth; eyes lacked luster; anemia; loss of vitality and weight; very irritable, often showing a tendency to bite when handled.

Jersey Bulletin 1931 50:210-211;224-226, 237

Anemia and Behavior

- “Infants with chronic, severe iron deficiency have been observed to display increased fearfulness, unhappiness, fatigue, low activity, wariness, solemnity and proximity to the mother during free play, development testing and at home.”
- Anemic infants who did not receive iron supplementation “never smiled, never interacted socially, and never showed social referencing.”

Lozoff B and others. *Journal of Nutrition* 137:683-689.

Studies of Mattick and Golding - 1935

- Rats fed sterilized milk had hair loss; those fed raw milk did not.
- Lowered reproductive capacity in rats fed sterilized milk.
- “Two females which had received sterilized milk for about eight months showed remarkable improvement after receiving raw milk for about eleven weeks, and one gave birth to a litter when mated to a buck from the raw milk group. Previous to this, 15 matings had been attempted with does and bucks both reared on sterilized milk, and no signs of pregnancy were shown on any one of these occasions.”

Mattick EC and Golding J. *The Lancet*. Sep 19, 1936, 703-704.

British Orphanage Study - 1937

TWO GROUPS:

Group I: 750 boys got pasteurized milk for 5 years.

Group II: 750 boys got raw milk for 5 years.

RESULTS FOR TB:

Group I had 14 cases of TB

Group II had 1 case.

OTHER BENEFITS: “The child on raw milk is very fit. Chilblains are practically eliminated. The teeth are less likely to decay. The resistance to tuberculosis and other infections is raised.”

Lancet, May 8, 1937:1142

Randleigh Farm Rat Studies – 1935-1940

HISTORY OF RANDLEIGH FARM



Rat fed only raw milk from cows fed dry ice grass silage and grain. Notice absence of acrodynia.



Rats fed only pasteurized milk from cows fed dry ice grass silage. Hairless areas (acrodynia) are due to a deficiency of vitamin B₆.

Raw vs. Pasteurized Milk at Randleigh Farm, 1935-1940

Above: Rat fed only raw milk. Good development, healthy fur.

Below: Rats fed only pasteurized milk. Poor development. Hairless areas (acrodynia) due to deficiency of vitamin B-6.

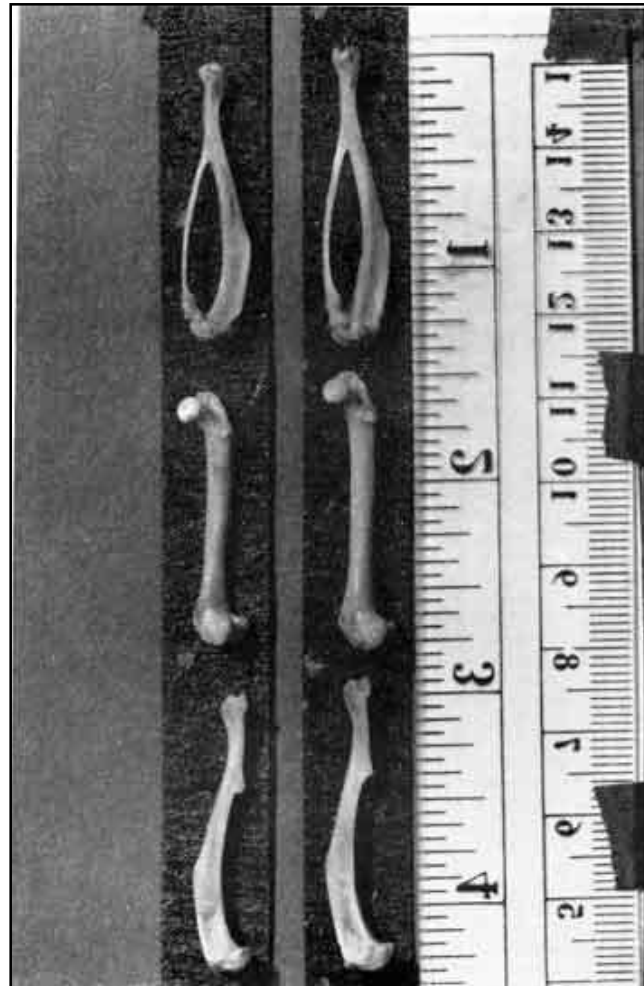
Bone Development

Randleigh Farm Study

**PASTEURIZED-
Milk-Fed Rat**

**Weighed 146
grams**

**Bones shorter
and less dense**



**RAW-Milk-Fed
Rat**

**Weighed 206
grams**

**Bones longer
and more dense**

One-to-One Exposure of Femur, Tibia and Fibula

Internal Development

Randleigh Farm Study

Rat fed pasteurized milk had poor color and compromised integrity of internal organs.



Cat Studies of Francis Pottenger, 1935-1940

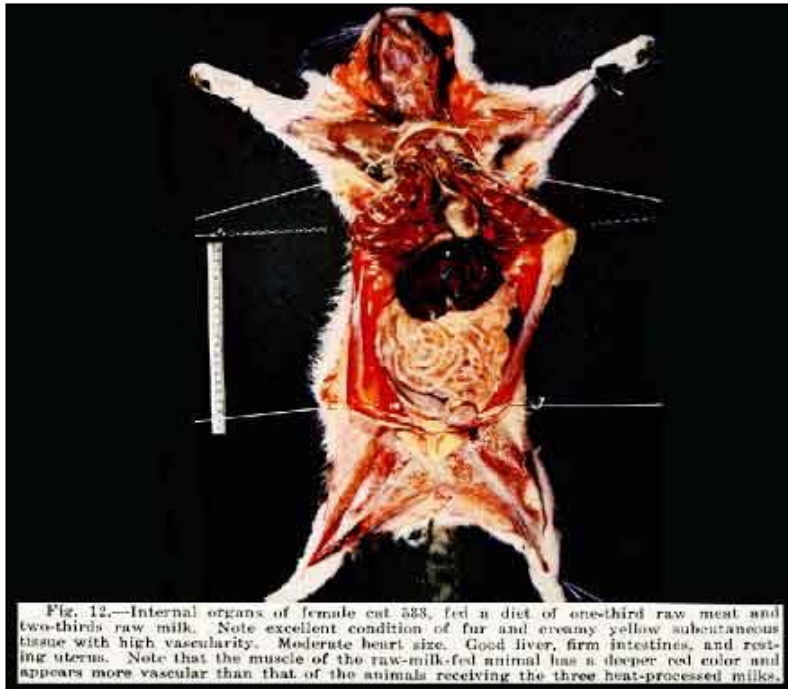


Fig 12. Internal organs of a female cat fed diet of one-third raw meat and two-thirds raw milk. Note excellent condition of fur and creamy yellow subcutaneous tissue with high vascularity. Moderate heart size. Good liver, firm intestines and resting uterus.

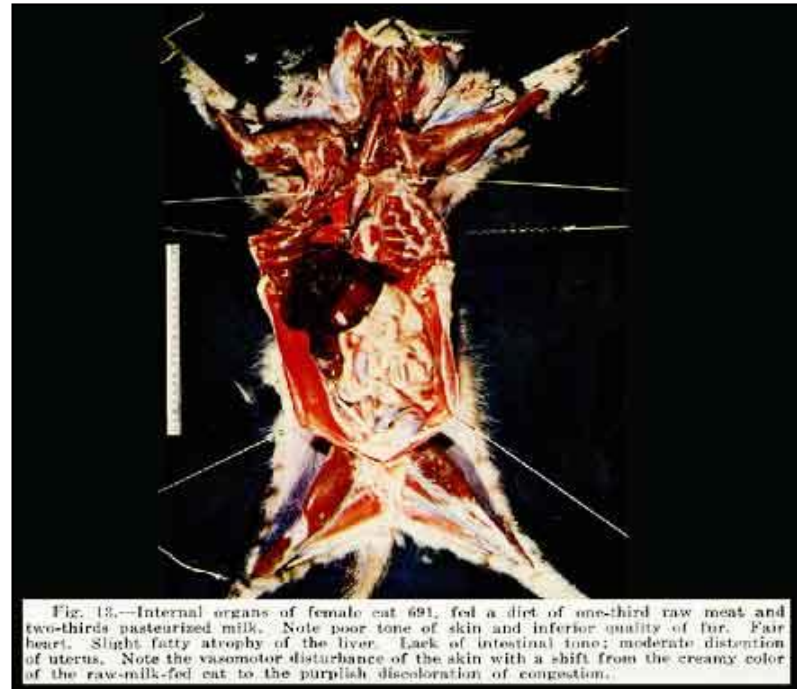


Fig 13. Internal organs of female cat fed diet of one-third raw meat and two-thirds pasteurized milk. Note poor tone of skin and inferior quality of fur. Fair heart. Slight fatty atrophy of the liver. Lack of intestinal tone; moderate distention of the uterus. Skin has a purplish discoloration due to congestion.

Guinea Pig Studies of Wulzen & Bahrs - 1941

By Dr. Rosalind Wulzen and Alice Bahrs, Department of Zoology, Oregon State College 1941

Whole Raw Milk	Excellent growth; no abnormalities
Whole Pasteurized Milk	Poor growth; muscle stiffness; emaciation and weakness; death within one year. Autopsy revealed atrophied muscles streaked with calcification; tricalcium deposits under skin, in joints, heart and other organs.

Am J Physiology 1941, 133, 500

Study on Calves

1941 STUDY carried out at the West of Scotland Agricultural College at Auchincruive.

TWO GROUPS, each of eight calves, were fed, one group on raw milk, the other on pasteurized milk for 90 days

NO DEATHS IN RAW MILK GROUP: All the animals in the raw milk group finished the trial without mortality.

THREE DEATHS IN PASTEURIZED MILK GROUP: In the pasteurized milk group, two died before they were 30 days old, and a third died on the 92nd day; that is two days after the experiment.

ILL HEALTH IN PASTEURIZED MILK GROUP: The remaining calves in the pasteurization group were in ill health at the end of the experiment, while all of the animals in the raw milk group were in excellent health.

JM Mercer. An Experiment in Milk Pasteurization. *Nature's Path*, March 1941. In Bryant CP. *The Truth About Pasteurization*, National Nutrition League, Seattle, Washington, 1943.

Raw Milk and Tooth Decay - 1943

Dr. Evelyn Sprawson of the London Hospital:
“ . . . In certain institutions, children who were brought up on raw milk. . . had perfect teeth and no decay. The result is so striking and unusual that it will undoubtedly be made the subject of further inquiry.”

James C. Thomson,
Pasteurized Milk, A National Menace.
The Kingston Chronicle. Edinburgh, Scotland, 1943,5.

Modern Milk Processing



Pasteurized Milk=Increasing Health Problems in Children

- Allergies
- Asthma
- Frequent Ear Infections
- Gastro-Intestinal Problems
- Diabetes
- Auto-Immune Disease
- Attention Deficit Disorder
- Constipation

During a period of rapid population growth, the market for fluid pasteurized milk has declined at 1% per year for the past 20 years. Fewer and fewer consumers can tolerate pasteurized (and ultrapasteurized) milk.

Other Problems with Industrial Milk

- Allowed levels of antibiotics. Only a few of at least 26 types are tested for.¹
- No labeling required for rBST.²
- Homogenization increases risk of rancidified fats.³
- Added Milk Solids and Milk Protein Concentrates.⁴
- Does not sour properly but decomposes (putrifies) making it useless for many purposes.⁵
- Ultrapasteurized milk cannot be used to make cheese, which means it is indigestible.
- Grain fed cattle: implications.⁶
- Unsanitary conditions at pasteurized milk producers
- Is NOT the same as raw milk nutritionally! (enzymes, proteins, microorganisms)⁷

Infants on Pasteurized Human Milk - 1986

- Did not gain weight as quickly compared to those fed raw human milk. *J Pediatr Gastroenterol Nutr.* 1986 Mar-Apr;5(2):248-53.
- More rapid weight gain in premature babies given raw human milk compared to pasteurized human milk. Problems attributed to destruction of lipase. *J Pediatr Gastroenterol Nutr.* 1986 Mar-Apr;5(2):242-7.
- CDC website notes that breast milk is best protection to infants “against salmonellosis and many other health problems.” Yet the agency warns against raw milk as a cause of salmonellosis. Cdc.gov/ncidod/dbmd/diseaseinfo/salmonellosis_g.htm.

The Milk Cure

- **ANCIENT:** Since ancient times, an exclusive raw milk diet has been used to cure many diseases.
- **MAYO CLINIC:** In the early 1900s, the “Milk Cure” was used at the Mayo clinic to successfully treat cancer, weight loss, kidney disease, allergies, skin problems, urinary tract problems, prostate problems, chronic fatigue and many other chronic conditions.
- **ONLY WITH RAW MILK:** The Milk Cure only works with raw milk; pasteurized milk does not have these curative powers.

Crewe, JR. “The Milk Cure,” <http://www.realmilk.com/milkcure.html>

Asthma Crisis

- According to the CDC, asthma is the second most prevalent chronic condition among children. It results in approximately **14 million days of missed school** each year. Asthma in children increased from 3.6% in 1980 to 7.5% in 1995, or approximately 5 million children.
- What if we could prevent most of these cases through something as simple as offering raw milk in childhood?

Asthma & Raw Milk - 2001

- **Exposure to farming in early life and development of asthma and allergy: a cross-sectional survey.**
- Summary: Long-term and early-life exposure to stables and [raw] farm milk induces a strong protective effect against development of asthma, hay fever, and atopic sensitization [rashes].

Lancet. 2001 Oct 6;358(9288):1129-33

Asthma & Raw Milk - 2006

Researchers in London concluded that children who even *infrequently* drank raw milk had significantly less current eczema symptoms and a greater reduction in atopy (allergic hypersensitivity).

J Allergy Clin Immunol. 2006 Jun;117(6):1374-81.

Asthma & Raw Milk – 2007

- In a study of 14,893 children aged 5-13, consumption of raw milk was the strongest factor in reducing the risk of asthma and allergy, whether the children lived on a farm or not.
- The benefits were greatest when consumption of farm milk began during the first year of life.

Clinical & Experimental Allergy. 2007 May; 35(5) 627-630.

Asthma & Raw Milk – 2011

- Children drinking raw milk had 41 percent less asthma and half the rate of hay fever.
- Boiling farm milk removed the protective effect.
- Protective effect linked to whey proteins in milk, which are damaged by heat.

Journal of Allergy and Clinical Immunology. Online August 29, 2011.

Asthma & Foodborne Illness – Relative Risk

- About 5,500 people in the US die from asthma each year.
- About 1,250 people in the US die from food-borne pathogens from ALL sources. (No deaths from raw milk).
- Thus, the risk of dying from asthma is over four times greater than the risk of dying from food-borne pathogens from ALL sources, and infinitely greater than the risk of dying from raw milk.

Raw Milk and Glutathione

- Glutathione: Key compound for detoxification
- High levels in whey protein
- Research in 1991 discovered that whey proteins only boost glutathione status in their raw, undenatured state.
- Explains the success of the Milk Cure

Source: <http://www.westonaprice.org/blogs/cmaterjohn/2010/09/11/the-biochemical-magic-of-raw-milk-and-other-raw-foods-glutathione>

Fluorophotometric Demonstration of Orgone Energy in Various Fluids

by Wilhelm Reich

Reich considered fluorophotometric values an expression of orgone energy, lumination or life energy potency.

- Milk pasteurized = 55
- Milk not pasteurized = +100

The Cancer Biopathy by W. Reich.

64	WILHELM REICH
Fluid	(OP)
Distilled water	1
Rain water	3
Tap water	4
Sea water	8
Sand in H ₂ O, filtered	1
Iron filings in H ₂ O, filtered	5
Charcoal powder in H ₂ O, filtered	7
Earth in H ₂ O, filtered	8
Earth bions in H ₂ O, filtered	50 (average)
Grass in H ₂ O (after development of bions and protozoa), filtered	13
Urine	43
NaCl (physiol. sol.)	4
KCl (0.1 normal)	2
CaCl ₂ " "	2.5
HCl " "	1
NaOH " "	2
Ringer's solution	1.5
HgCl ₂ (disinfectant)	3.5
Alcohol (95%)	3
Culture broth	45
50% Broth, 50% KCl	60
White sugar (saturated solution)	9
Brown sugar " "	13
Maple syrup " "	27
Dextri-Maltose " "	41
Honey	73
Orange juice	7
Milk (pasteurized)	55
Milk (not pasteurized)	100+
Egg white	25
Tea	2
Whisky (blended)	11

Raw Milk Digests Itself!

- **ACTIVATED ENZYMES:** The enzymes in raw milk, when activated by the appropriate pH of the digestive tract, become activated and digest all the components in the milk.
- **NO WORK:** The body's digestive apparatus does not need to do any work to digest raw milk.
- **CURATIVE, ENERGIZING:** This is a major reason raw milk has such extraordinary healing and energizing powers.
- **OVERBURDEN:** Pasteurized milk puts a huge burden on the digestive apparatus and for many is impossible to digest.

Lactose Intolerance

- Results from a survey by Opinion Research Corporation (commissioned by the Weston A. Price Foundation) indicate that about 29 million Americans are diagnosed lactose intolerant.
- Results from a private survey carried out in Michigan indicate that 82 percent of those diagnosed as lactose intolerant can drink raw milk without problem.
- Thus, almost 24 million Americans diagnosed as lactose intolerant could benefit from raw milk.

Raw Milk and Casein Intolerance

- Milk allergy is usually attributed to casein intolerance.
- Pasteurization destroys *L. lactis* and other lactic-acid bacteria indigenous to milk.
- These bacteria produce enzymes that break down the casein molecule.
- These findings suggest that raw milk could be consumed by those with milk allergy, including autistic children.
- We have received testimonials indicating that raw milk can be used to treat and even completely reverse symptoms of autism.

Meisel and others. *Antonie Van Leeuwenhoek*. 1999;76(1-4):207-15

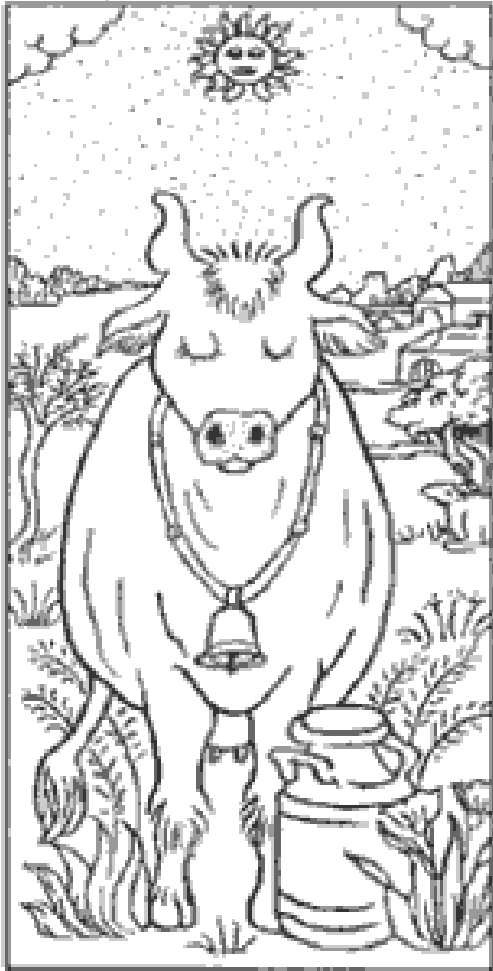
Lowered Nutrient Availability in Pasteurized Milk

Vitamin C	Raw milk but not pasteurized can resolve scurvy. “. . . Without doubt. . . the explosive increase in infantile scurvy during the latter part of the 19 th century coincided with the advent of use of heated milks. . .” Rajakumar, <i>Pediatrics</i> . 2001;108(4):E76
Calcium	Longer and denser bones on raw milk. Studies from Randleigh Farms.
Folate	Carrier protein inactivated during pasteurization. Gregory. <i>J. Nutr.</i> 1982, 1329-1338.
Vitamin B12	Binding protein inactivated by pasteurization.
Vitamin B6	Animal studies indicate B6 poorly absorbed from pasteurized milk. Studies from Randleigh Farms.
Vitamin A	Beta-lactoglobulin, a heat-sensitive protein in milk, increases intestinal absorption of vitamin A. Heat degrades vitamin A. Said and others. <i>Am J Clin Nutr.</i> 1989;49:690-694. Runge and Heger. <i>J Agric Food Chem.</i> 2000 Jan;48(1):47-55.
Vitamin D	Present in milk bound to lactoglobulins, pasteurization cuts assimilation in half. Hollis and others. <i>J Nutr.</i> 1981;111:1240-1248; <i>FEBS Journal</i> 2009 2251-2265.
Iron	Lactoferrin, which contributes to iron assimilation, destroyed during pasteurization.
Iodine	Lower in pasteurized milk. Wheeler and others. <i>J Dairy Sci.</i> 1983;66(2):187-95.
Minerals	Bound to proteins, inactivated by pasteurization; Lactobacilli, destroyed by pasteurization, enhance mineral absorption. <i>BJN</i> 2000 84:S91-S98; MacDonald and others. 1985.

Summary

- Research has shown that there is a **very significant difference** in the nutritional value of unpasteurized milk versus pasteurized milk.
- Pasteurization of milk is one of the **greatest public health disasters** in history.
- What's at stake: The health of millions of children worldwide. Raw milk during childhood can mean the difference between a healthy productive life and a miserable life.

Part 3: Is Milk from Pastured Cows More Nutritious?



“Milk is milk and it’s all produced the same way--by cows. .”¹

—Dennis T. Avery,
Center for Global Food Issues

1. *Global Food Quarterly*, December 2002.

Confinement Dairy System

Cows never leave stalls; life span averages 42 months.



Confinement Dairy System



Cows bred to have large udders; they are typically milked three times per day.

NOTE: We do NOT recommend raw milk from cows in the conventional dairy system!



Feed Given to Confinement Cows

Feed	Result in Milk
Soy	Not digested. Soy needs to be fermented for it to become digestible. Allergenic soy protein and estrogenic isoflavones
GMO grains	Aflatoxins (liver poisons)
Bakery waste	<i>Trans</i> fatty acids
Citrus peel cake	Cholinesterase inhibitors (pesticides that act as nerve poisons)
Hormones and antibiotics	Hormones and antibiotics
Pellets from ethanol production!	Chemicals used in ethanol production.

Ethanol Production and Giant Dairies

From the Ohio Farmer, July 12, 2007

Harrison Ethanol's PTI includes construction of a new 2,000-cow dairy facility and a new 10,000-head beef facility. The dairy facility will consist of two freestall barns for housing the dairy cows, with one barn housing 1,332 cows and the other barn housing 668 cows. The beef facility includes eight barns, four receiving barns (each capable of housing 350 head of cattle) and four beef finishing barns (each capable of housing a total of 2,150 head of cattle). Biodigesters will be used to transfer animal waste from the project into either methanol or electric.

"Some of the site preparation for the Major Concentrated Animal Feeding Facility was completed in the fall of 2006," said Boggs. "However, that construction has not continued consistently during 2007 at Harrison Ethanol, LLC. Consequently, the farm requested an extension of its PTI, as allowed by department rules. It is our understanding that construction will continue after financing for the project is finalized."

The construction of a 12,800-animal facility requires the owners to obtain permits from ODA. Because the farm will exceed 10,000 cattle, it is considered a MCAFF. Harrison Ethanol is a subsidiary of Farmers' Ethanol, LLC.

Adulterated Food Definition

A food shall be deemed to be adulterated:

(a) if:

- (1) It bears or contains any poisonous or deleterious substance which may render it injurious to health; but in case the substance is not an added substance, the food shall not be considered adulterated under this subdivision if the quantity of the substance in the food does not ordinarily render it injurious to health.

**According to this FDA definition,
pasteurized milk is an adulterated food.**

**But FDA claims that raw milk is an
adulterated food!**

Pasture-Fed versus Stall-Fed

“Milk varies with the season and with the feeding of the cow, especially in regard to vitamin content...the public deserves to have the information that there is a great difference between the milk derived from pasture-fed cattle and that obtained in winter from stall-fed animals, unless particular attention is paid to their diet, and that dirty milk is a menace rather than a blessing.”

American J Public Health 18:634, 1928

Cows on Pasture



Confinement vs. Grass-Fed Butter



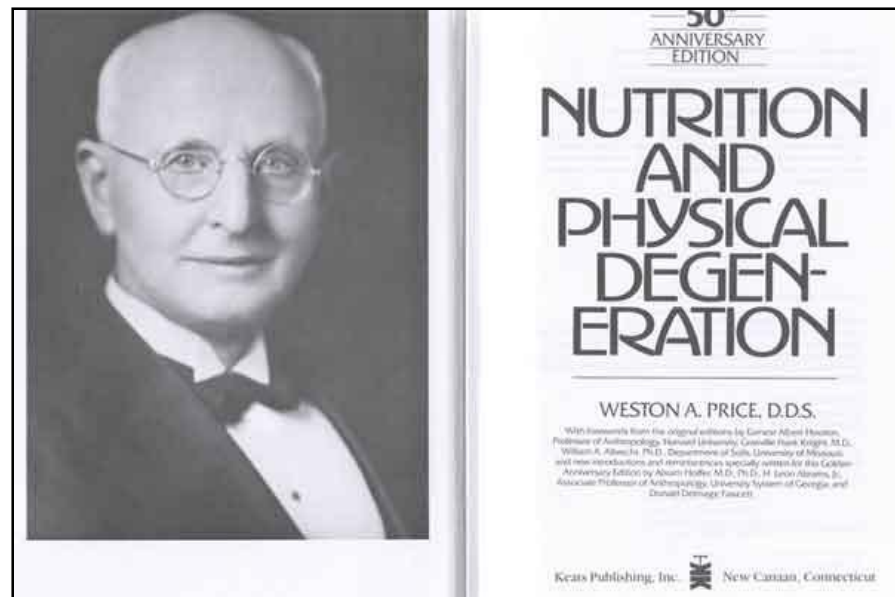
Yellow color of grass-fed butter indicates it is rich in vitamins A, D, and K₂, and Conjugated Linoleic Acid (CLA), a substance that protects against cancer and helps with weight loss.

Nutrient Levels in Traditional Diets

The key finding of Dr. Weston A. Price:

Calcium and other Minerals – at least **four** times higher than the modern diet.

Vitamins A, D and K₂ – **Ten** times higher than the modern diet.



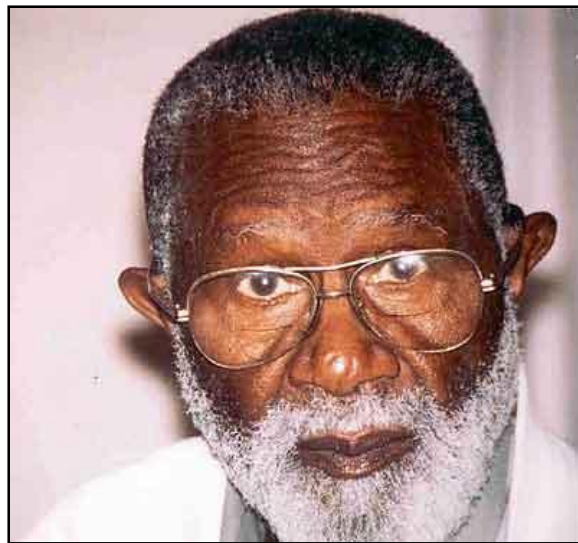
Traditional and Modern Face



The body requires high levels of available minerals and vitamins A, D and K_2 starting *in utero* for wide facial development (on right) and optimum health. Weston Price showed that the modern diet leads to the elongation of the facial structure (on left) and increased susceptibility to disease.

North America

Well-built facial structure of North Americans raised on raw dairy products from grass-fed cows, organ meats, sea food and cod liver oil.



Bill Cody's Wild West Show, 1910



With one exception (circled in red) all individuals in this photo, both Native and European Americans, have excellent facial structure. Today the individual with good facial structure is the exception. Americans in 1910 drank raw milk from pasture-fed cows.

Sources of Vitamins A, D and K₂ in the Traditional American Diet



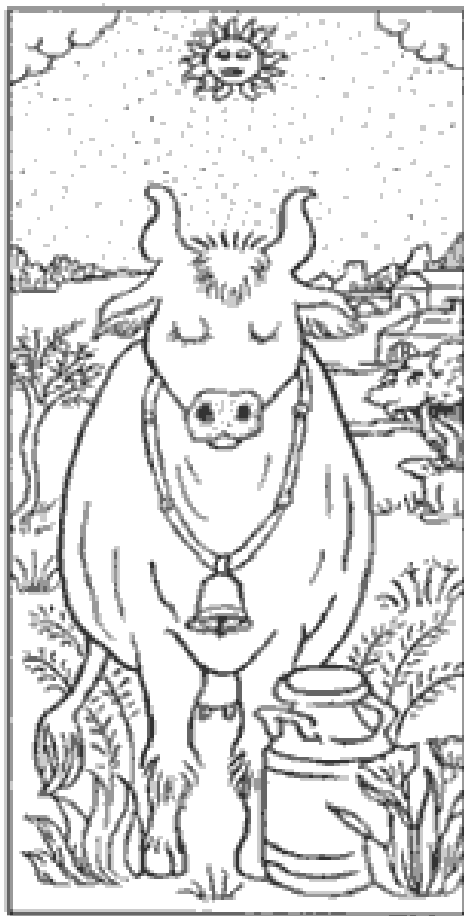
Butter, cream, cheese and whole milk from grass-fed animals; eggs from pastured-chickens; cod liver oil; lard (vitamin D). Also, liver and other organ meats as in sausage, pate, liverwurst, scrapple, etc.

Real (Raw) Cheese from Grass-Fed Cows



The perfect, complete storage food. Contains calcium, phosphorus, CLA, many minerals, B vitamins including B₁₂, vitamins A, D, E, K₂, and even vitamin C.

Part 4: Is Raw Milk Better for Farmers?



“Farmers who are investing in larger dairy units are undoubtedly those that will remain in dairying for the long haul and are adopting the ‘get big or get out’ attitude.”

John Mahe, Teagasc dairy specialist
Irish Independent, August 19, 2003

“Many of the more than 60,000 dairy farms in the United States have been cutting costs, selling off their cows, or leaving the dairy business altogether as milk prices plummet 35 percent in just the past two months, while dairy farm operating costs remain uncomfortably high. Some farms are losing \$200 per head every month.”

U.S. dairy farms in crisis as milk prices turn sour.

Reuters, February 9, 2009

Pasteurization Laws have destroyed rural life



Compulsory pasteurization laws, are largely responsible for the decline of American small towns and rural life.

Pasteurization laws transform what should be a local value-added product that keeps wealth in the local economy and into a commodity product that transfers wealth to large international corporations.



Milk Prices – 2007

CONVENTIONAL MODEL

\$16-17 per hundredweight

ORGANIC MODEL

\$20-25 per hundredweight

RAW MILK DIRECT SALES

\$50-\$250 per hundredweight

Milk Prices – 2009

CONVENTIONAL MODEL

\$12 per hundredweight

(Average on-farm cost of production = \$15.75)

ORGANIC MODEL

\$16 per hundredweight

(Two main organic dairy companies
dropped 10% of their farms in 2009)

Conventional dairy farms, no matter what the herd size,
are losing \$1.10 per head per day

RAW MILK DIRECT SALES

\$50-\$250 per hundredweight

Conventional Dairy Farm Economics

- 30 cows producing 190 hundredweight of milk per year
- Farmers receives about \$12 per hundredweight – comparable to price received in WW II
- **GROSS INCOME \$68,000** per year
- Costs include feed (to get high milk yield), vet bills and replacement cows (average life of cow is 42 months)
- **In 2002, dairy farms went out of business at a rate of 16 farms per day**

Economics of Pasture-Based Mixed Farm with Direct Sales

- 30 Cows on 100 Acres

Cows produce 100 hundredweight of milk each per year

Farmer sells milk at \$5 per gallon and equivalent price for cream, butter and cheese

Gross income from milk and milk products = **\$150,000**

- Minimal input for feed, vet bills; no replacement cow costs
- PLUS – whey and skim milk used to feed pigs and chickens. Income from eggs, broilers, turkeys, pork, beef, veal and broth = **\$50,000** with minimal input for feed, etc.
- **GROSS INCOME \$200,000** per year, with much lower costs.

Conventional Dairy vs Raw Dairy: Conservative Estimate

CONVENTIONAL

30 Cows

200 acres to raise feed

195 hdwt/cow

5460 hdwt total

COST: \$15.75/hdwt

PRICE: \$13.50/hdwt

GROSS: \$74,000

COST: \$86,000

Additional Sales: None

NET: Loss of \$12,000

GRASS FED RAW MILK

15 Cows

20 acres of pasture

120 hdwt/cow

1440 hdwt total

COST: \$30/hdwt

PRICE: \$50/hdwt (\$5 per gallon)

GROSS: \$84,000

COST: \$43,000

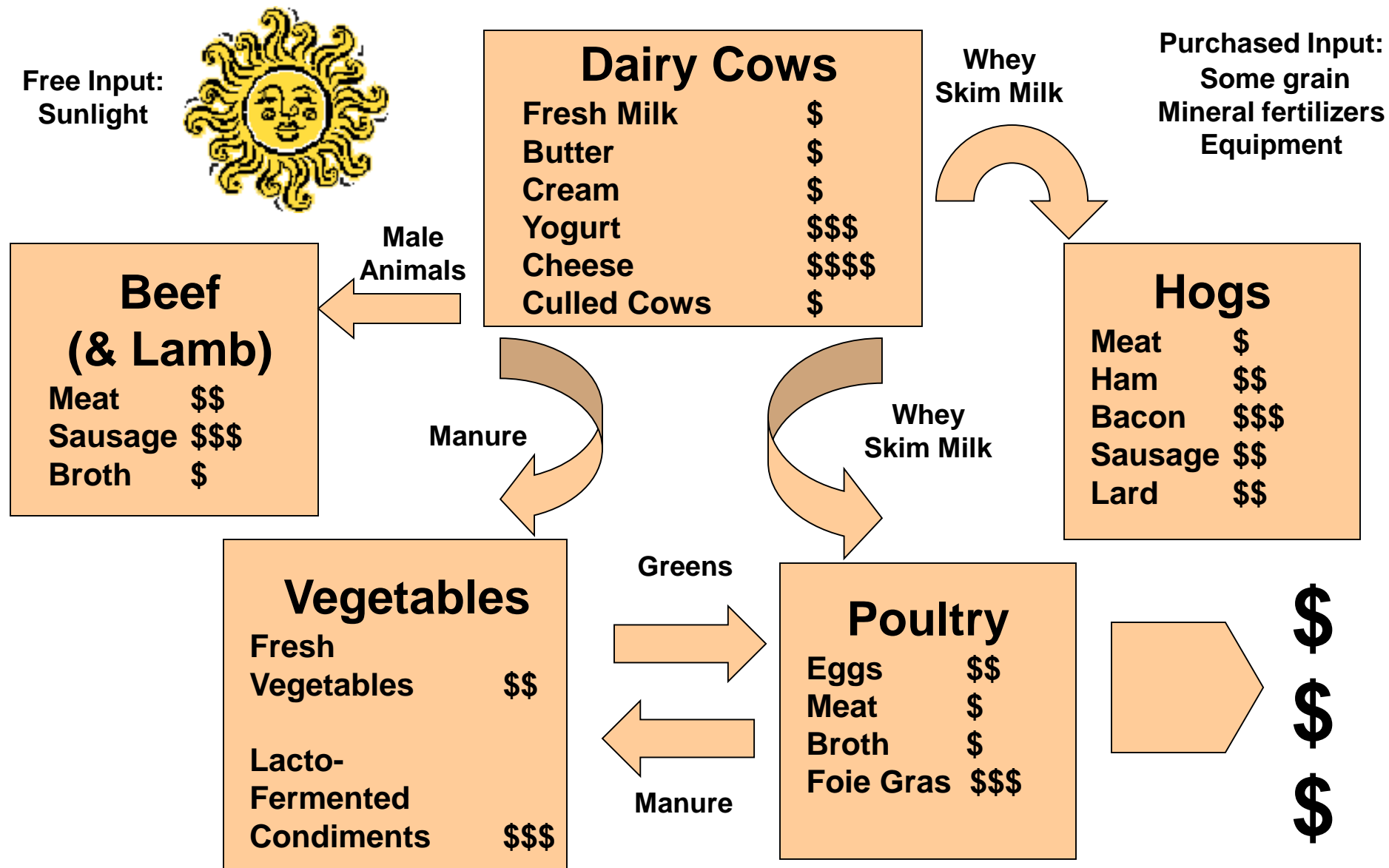
Additional Sales. Eggs, pork,
cows: \$15,000

NET: Profit of \$55,000

The Multiplier Effect

- Every \$1 earned on the farm = \$5-7 for the local community.
- If 10% of the population would buy raw milk and other products directly from the farm, we would need 75,000 farms, all making at least \$200,000 per year.
- Raw milk sales hold the potential for a huge rural revival.

Pasture-Based Mixed Farm



Impediments to Ideal Model

- Health Laws
- Biased, capricious permitting process
- Zoning Laws
- National Animal Identification System (NAIS)
— The Fulfillment of the Marxist Dream
- Looming Food Safety Legislation, HR 2749, S 510—would it give FDA jurisdiction over raw milk sales?

Animals as Units of Production

Key provision of Marx's *Communist Manifesto*



Industrial Crimes, Especially For Agriculture

Another key provision of Marx's *Communist Manifesto*



Photos from raid of Michael Schmidt's farm
in Ontario, Canada, November 21, 2006

NAIS — The Agenda

- NAIS is designed to eliminate grass-based livestock through the enforcement of industrial crimes for agriculture.
- It is the industry's attempt to eliminate the emerging competition from pasture-based farms.

The Milk Industry

- Concentrated in four companies: Land O'Lakes, Foremost, Dean Foods, Dairy Farmers of America.
- CEOs typically make over \$1 million per year
- Powerful behind-the-scenes lobbying group
- Opposes competition of raw milk, especially as it allows farmers to get a higher price for their milk.

Example of Dairy Industry Clout

- In January, 2008, Martha Stewart aired a segment about raw milk at Smith Family Farm in Maine.
- The milk industry then conducted “outreach” with Stewart to “educate” her on the dangers of raw milk consumption.
- “We discussed our concerns with Stewart’s producers at length, and were provided assurances that she will not talk about raw milk throughout her partnership with MilkPEP [Milk Processors Education Program] and additionally, that she will consider changing her overall position and commentary on raw milk in the future.

(Midwest Dairy Association Update, March 2008)

The Good News!

- Retail Sales of Raw Milk: Allowed in 8 states (CA, WA, AZ, NM, SC, ME, PA, CT)
- On-Farm Sales of Raw Milk: About 28 states.
- Raw Milk as Pet Food: Available in 4 states (GA, NC, FL, ND)
- Raw Milk widely available through cow-boarding or farm-share agreements in WI, MI, TN, VA, CO, OH, IN.
- Worst state laws for raw milk: HI, MD, RI, NJ, NV, ID, WV, IA, MT, WY. (Yet Raw milk from Pennsylvania widely available in MD and NJ.)
- Raw milk easily available in about 42 states.

Raw Milk in Europe

- Legal in England and Wales – the royal family drinks raw milk!
- Widely available in continental Europe through vending machines. . . even in schools!



Raw milk on the Vittoria Veneto!

- Hard to get in Scandinavia, Ireland.

Farm-To-Consumer Legal Defense Fund (FTCLDF)

- Legal Defense for Small Farmers

 - Raw Milk Protection

 - Right to On-Farm Processing and Direct Sales

 - Legal Opposition to NAIS

 - Help with farm-share and cow-share programs

- Recent legal successes in Ohio, New York, Pennsylvania, California

- Website: farmtoconsumer.org

- Phone: (703) 208-FARM



All truth passes through three stages.

First, it is ridiculed.

Second, it is violently opposed.

Third, it is accepted as self-evident.

—Arthur Schopenhauer

Resources



THE WESTON A. PRICE FOUNDATION®

for **Wise Traditions** in Food, Farming and the Healing Arts

westonaprice.org



Quarterly Magazine

Informational Brochures

Yearly Shopping Guide

Annual Conference

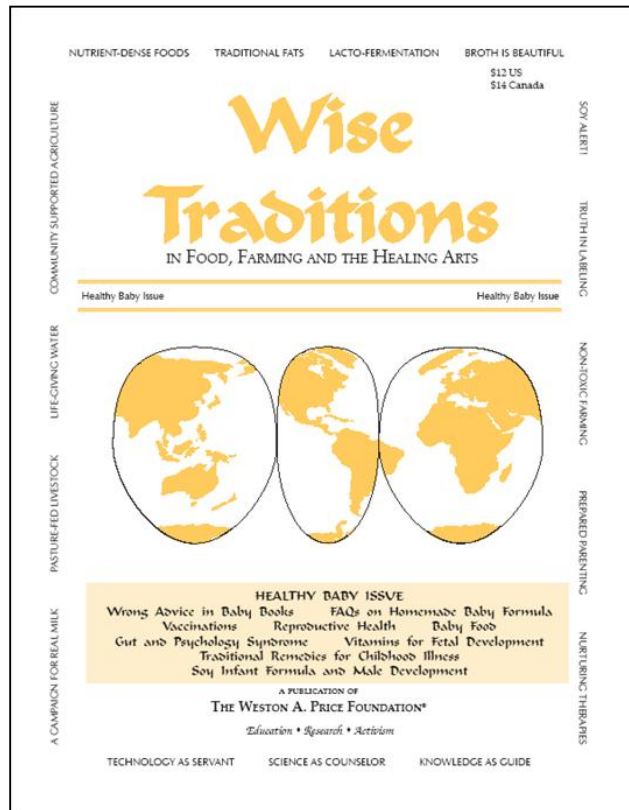
Local Chapters

Resources

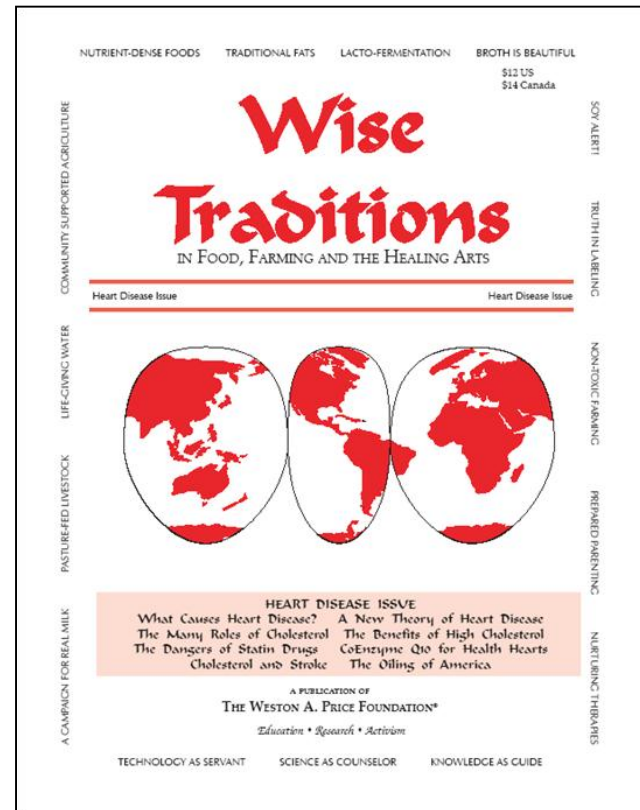


THE WESTON A. PRICE FOUNDATION®

for **Wise Traditions** in Food, Farming and the Healing Arts

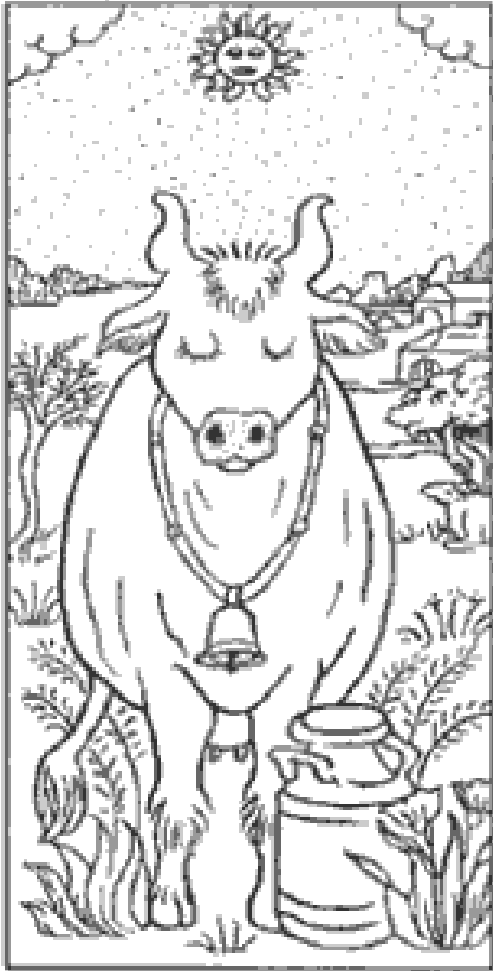


Healthy Baby Issue



Heart Disease Issue

Resources

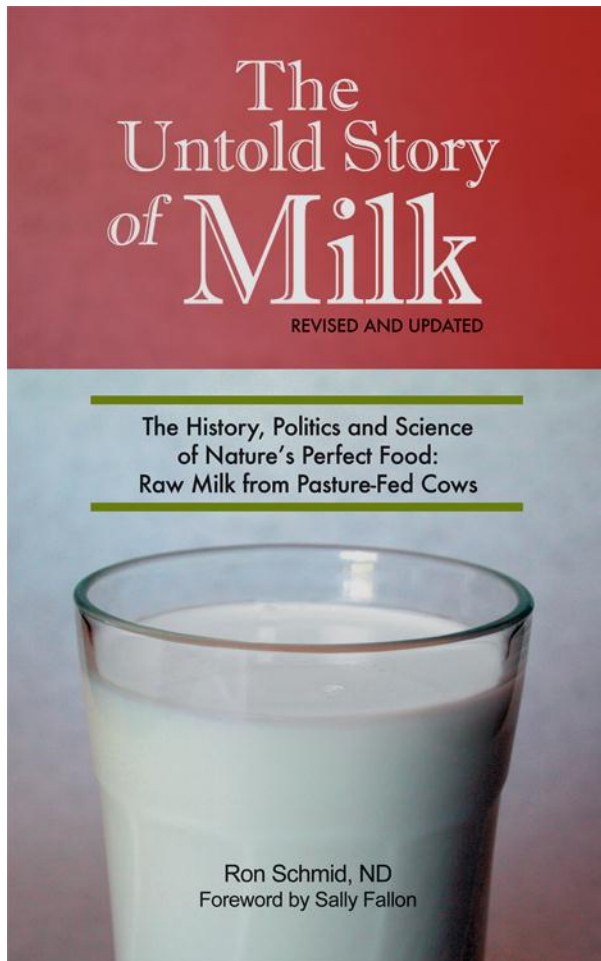


A Campaign for Real Milk **realmilk.com**

A Project of the
Weston A. Price Foundation

Many articles on
raw milk and raw cheese;
sources for raw milk.

Resources



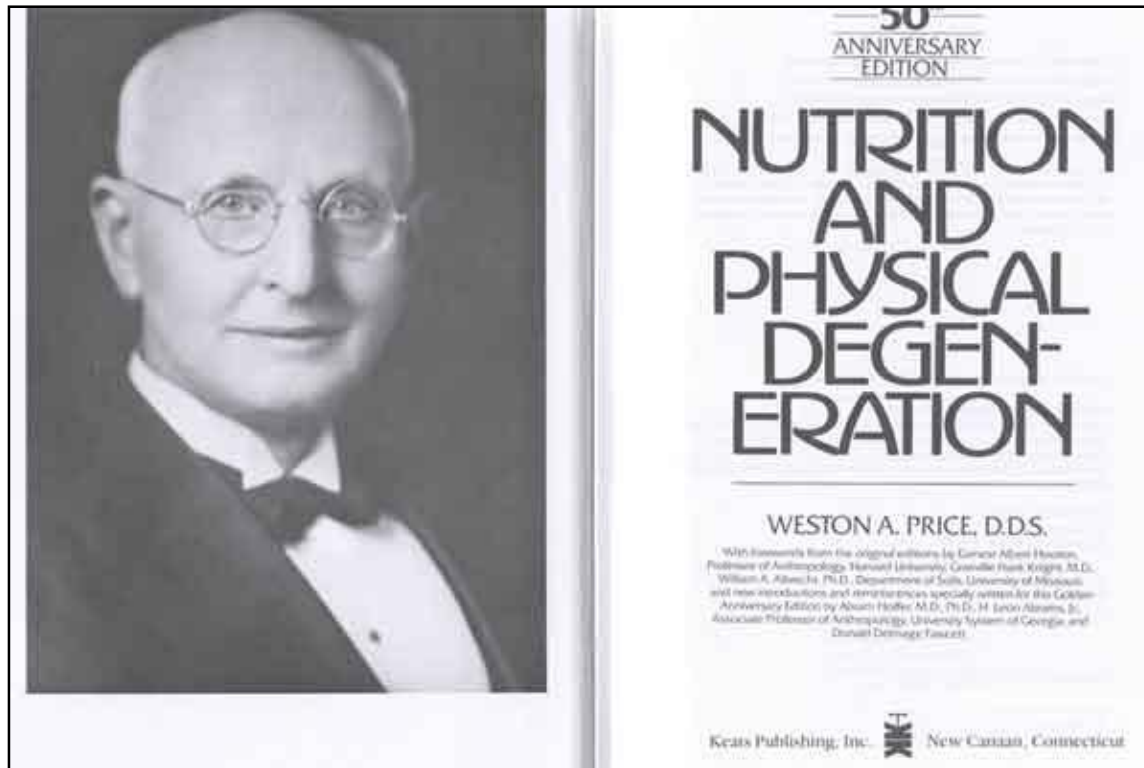
The Untold Story of Milk

REVISED AND UPDATED

by Ron Schmid

New Trends Publishing
newtrendspublishing.com
(877) 707-1776

Resources



Nutrition and Physical Degeneration

Price-Pottenger Nutrition Foundation

price-pottenger.org

(619) 462-7600

Summary

Traditional diets *maximized* nutrients
while modern diets *minimize* nutrients

TRADITIONAL DIETS

Foods from fertile soil
Choice of organ meats over muscle meats
Animal fats
Animals on pasture
Dairy products raw and/or fermented
Grains and legumes soaked/fermented
Bone broths
Unrefined sweeteners (honey, maple syrup)
Lacto-fermented vegetables
Lacto-fermented beverages
Unrefined salt
Natural vitamins in foods
Traditional cooking
Traditional seeds/open pollination

MODERN DIETS

Foods from depleted soil
Muscle meats, few organ meats
Vegetable oils
Animals in confinement
Dairy products pasteurized
Grains refined and/or extruded
MSG, artificial flavorings
Refined sweeteners
Canned vegetables
Modern soft drinks
Refined salt
Synthetic vitamins added to foods
Microwave, irradiation
Hybrid seeds, GMO seeds