# Raw Milk and Raw Milk Products

## Safety, Health, Economic and Legal Issues

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# Contents

# Part One:
# Safety of Raw vs. Pasteurized Milk

## Raw Milk is Uniquely Safe

**Consider the calf, born in the muck, which then suckles on its mother's manure-covered teat. How can that calf survive?**

**Because raw milk contains multiple, 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 bacteria**

**In all mammalian secretions—breast milk, tears, etc.**

**Lactoperoxidase levels *10 times higher* in goat milk than in breast milk**

**Other countries are looking into using lactoperoxidase instead to pasteurization to ensure safety of commercial milk**


*British Journal of Nutrition (2000), 84, Suppl. 1. S19-S25.*
*Indian Journal Exp Biology Vol. 36, August 1998, pp 808-810.*
*1991 J Dairy Sci 74:783-787*
*Life Sciences, Vol 66, No 23, pp 2433-2439, 2000*

## Built-In Protective Systems in Raw Milk
## Other Bio-Active Components I

**Lactoferrin** - Steals iron away from pathogens and carries it through the gut wall into the blood stream; stimulates the immune system.

**Polysaccharides** - Encourage the growth of good bacteria in the gut; protect the gut wall

**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.

**Enzymes** – Disrupts bacterial cell walls.

**Antibodies** - Bind to foreign microbes and prevent them from migrating outside the gut; initiate immune response.
(*British Journal of Nutrition* (2000) 84. Suppl. 1, S3-S10, S11-S17)

## Built-In Protective Systems in Raw Milk
## Other Bioactive Components II

**White Blood Cells** – Produce antibodies against specific bacteria

**B-lymphocytes** – Kill foreign bacteria; call in other parts of the immune system

**Macrophages** – Engulf foreign proteins and bacteria

**Neutrophils** – Kill infected cells; mobilize other parts of the immune system

**T-lymphocytes** – Multiply if bad bacteria are present; produce immune-strengthening compounds.

## Built-In Protective Systems in Raw Milk
## Other Bioactive Components III

**Lysosyme** – Kills bacteria by digesting their cell walls.

**Hormones & Growth Factors** – Stimulate maturation of gut cells; prevents "leaky" gut.

**Mucins** – Adhere to bacteria and viruses, preventing those organisms from attaching to the mucosa and causing disease.

**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.

## Built-In Protective Systems in Raw Milk
## Other Bioactive Components IV

**B12 Binding Protein** – Reduces vitamin B-12 in the colon, which harmful bacteria need for growth

**Bifidus Factor** – Promotes growth of Lactobacillum bifidis, a helpful bacteria in baby's gut, which helps crowd out dangerous germs

**Fibronectin** – Increases antimicrobial activity of macrophages and helps to repair damaged tissues.

## Destruction of Built-In Safety Systems by Pasteurization

| Component | Breast Milk | Raw Milk | Pasteurized Milk | Infant Formula |
|---|---|---|---|---|
| B-lymphocytes | X | X | inactivated | inactivated |
| Macrophages | X | X | inactivated | inactivated |
| Neutrophils | X | X | inactivated | inactivated |
| Lymphocytes | X | X | inactivated | inactivated |
| IgA/IgG Antibodies | X | X | inactivated | inactivated |
| B12 Binding Protein | X | X | inactivated | inactivated |
| Bifidus Factor | X | X | inactivated | inactivated |
| Medium-Chain Fatty Acids | X | X | reduced | reduced |
| Fibronectin | X | X | inactivated | inactivated |
| Gamma-Interferon | X | X | inactivated | inactivated |
| Lactoferrin | X | X | inactivated | inactivated |
| Lyxozyme | X | X | inactivated | inactivated |
| Mucin A/Oligosaccharides | X | X | reduced | inactivated |
| Hormones & Growth Factors | X | X | reduced | inactivated |

*Scientific American*, December 1995
*The Lancet*, Nov 17, 1984

# *Campylobacter*
## The most common cause of food-borne illness

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

**Meats sampled for *Campylobacter* 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% |

Zhao C, et al. *Applied and Environmental Microbiology*, 2001:67(12):5431-5436

## Pathogens Can Multiply in Pasteurized Milk and Other Foods But Not in Raw Milk

***Campylobacter*** **in chilled raw milk (4° C)**

**Day 0 = 13,000,000/ml**
**Day 9 = less than 10/ml**

**(Doyle, et al. *Applied and Environmental Microbiology*, 1982;44(5):1154-58)**

***Campylobacter*** **in body temperature raw milk (37° C)**

**Bovine strains decreased by 100 cells/ml in 48 hrs**
**Poultry strains decreased by 10,000 cells/ml in 48 hrs**

**(Diker KS. *Mikrobiyol Bul* 1987 Jul;21(3):200-5)**

**Note that the protective components work more quickly to reduce levels of pathogens in body temperature milk than in chilled milk.**

# Raw Milk Destroys Pathogens Through Challenge Tests

**Lactoperoxidase in raw milk kills added fungal and bacterial agents**

*Life Science* 2000 66(25):2433-9

*Indian Journal of Experimental Biology* 1998;36:808-11

**Raw goat milk kills campylobacter jejuni in a challenge test.**

*Hygiene* (London) 1985 Feb;94(1):31-44.

# Pasteurized Milk More Hazardous Than Raw Milk

**RAW MILK:** Incidence of food-borne illness from raw milk – 1.9 cases per 100,000 people, 1973-1992.

(*American Journal Public Health* Aug 1998, Vol 88., No 8)

**PASTEURIZED MILK:** Based on CDC website, incidence of food-borne illness from all foods including pasteurized milk – 4.7 cases per 100,000 people, 1993-1997.

(US Census Bureau 1997 population estimate 267,783,607)

**OTHER FOODS:** Based on CDC website, incidence of reported food-borne illness from other foods – 6.4 cases per 100,000 people, per year from 1993-1997.

**THEREFORE**, the incidence of food-borne illness from consuming raw milk is 2.5 times lower than the incidence of food-borne illness from consuming pasteurized milk; and 3.5 times lower than the incidence of food-borne illness from consuming other foods.

# 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 |
| Salads | 21 | 4.2 | 1104 | 9.2 |
| Fruits and Vegetables | 15 | 3.0 | 719 | 6.0 |
| Eggs | 3 | 0.6 | 91 | 0.8 |
| Chicken | 9 | 1.8 | 256 | 2.1 |

**Pasteurized milk is safer than other foods and raw milk is safer than pasteurized milk.**

*MMWR* Vol 45, No SS-5

## Of All Foods, Milk has the Lowest Incidence of Reported Food-Borne Illnesses (0.2%)

On a case-by-case basis, persons consuming milk from ANY source (raw or pasteurized) are:

- 30 times more likely to become ill from fruits and vegetables
- 13 times more likely to become ill from beef
- 11 times more likely to become ill from chicken
- 10 times more likely to become ill from potato salad
- 2.7 times more likely to become ill from non-dairy beverages

***MMWR Vol 45, No SS-5***

# REPORTED OUTBREAKS OF FOOD-BORNE ILLNESS

| RAW MILK WARNING LABEL | PASTEURIZED MILK **NO WARNING LABEL** | OTHER FOODS **NO WARNING LABEL** |
|---|---|---|
| No outbreaks of human illness from consumption of raw milk in California. | 1997, 28 persons ill from *Salmonella* in California, ALL FROM PASTEURIZED MILK. | Massachusetts, June 1996, 38 persons ill and possibly contributing to one death from food contaminated with *Salmonella* served in a Wendy's restaurant. |
| No outbreaks of human illness from consumption of raw milk in California. | 1996, 46 persons ill from *Campylobacter* & *Salmonella* in California. | Idaho, September 1995, 11 people ill due to *E. coil 0157:H7* traced to food eaten in a Chili's restaurant in Boise. |
| No outbreaks of human illness from consumption of raw milk in California. | 1994, 105 persons ill from *E. coil* and *Listeria* in California | Florida, August 1995, 850 people ill from *Salmonella newport* bacteria in chicken served at Margarita y Amigos restaurant in West Palm Beach. |
| No outbreaks of human illness from consumption of raw milk in California. | March of 1985 19,660 confirmed cases of *Salmonella typhimurium* illness FROM CONSUMING PROPERLY PASTEURIZED MILK. Over 200,000 people ill from *Salmonella typhimurium* in PASTEURIZED MILK | Utah, January 1995, 96 people ill from hepatitis A traced to an employee of a Taco Bell restaurant in Salt Lake City |
| No outbreaks of human illness from consumption of raw milk in California. | 1985, 142 cases and 47 deaths traced to PASTEURIZED Mexican-style cheese contaminated with *Listeria monocytogenes*. *Listeria monocytogenes* SURVIVES PASTEURIZATION! | Washington, DC, August 1994, 56 people ill and 20 hospitalized from *Salmonella* in Hollandaise sauce. |
| No outbreaks of human illness from consumption of raw milk in California. | 1985, 1500 persons ill from *Salmonella* infection | Georgia, October 1993, one dead, 7 others ill from botulism in canned cheese sauce. |
| No outbreaks of human illness from consumption of raw milk in California. | August of 1984 approximately 200 persons became ill with a *Salmonella typhimurium* from CONSUMING PASTEURIZED MILK | Illinois, June 1993, 41 people ill, 25 hospitalized from *Salmonella* in food served at a Mexican restaurant. |
| No outbreaks of human illness from consumption of raw milk in California. | November of 1984, another outbreak of *Salmonella typhimurium* illness from CONSUMING PASTEURIZED MILK | Oregon, March 1993, 48 people ill from *E. coil 0157:H7* in mayonnaise served at Sizzler restaurant. |
| No outbreaks of human illness from consumption of raw milk in California. | 1983, over 49 persons with *Listeria* illness have been associated with the consumption of PASTEURIZED MILK in Massachusetts. | An additional 50 cases of illness caused by *E. coil 0157:H7* bacteria in food served in Sizzler's restaurants in Oregon and Washington were reported to CDC in 1993. |
| No outbreaks of human illness from consumption of raw milk in California. | 1993, 28 persons ill from *Salmonella* infection | The western US, December 1992 to January 1993, 700 people ill from *E. coil 0157:H7* in hamburgers served at Jack-in-the-Box restaurants in Washington, Idaho, Nevada and California. Nearly 100 of the victims developed hemolytic uremic syndrome, a serious complication resulting from *E. coil 0157:H7* infection, and four children died. |
| No outbreaks of human illness from consumption of raw milk in California. | 1982, 172 persons ill (100 hospitalized) from a three Southern state area from PASTEURIZED MILK. | |
| | 1982, over 17,000 persons became ill with *Yersinia enterocolitica* from PASTEURIZED MILK bottled in Memphis, Tennessee. | |

## 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.**

**Jiang and Doyle.** ***Journal of Food Protection*** **1999;62(7):805-7**

## Soy Products Contain Pathogens

**1998 survey looked at 4 brands of soymilk; five types of microorganisms found in stored soymilk samples. During storage at 5 degrees C, microbial counts increased sharply after 2-3 weeks.**

***Journal of Food Protection*, Vol 61, No 9, 1998, pp 1161-1164.**

**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.**

***Applied and Environmental Microbiology*, Mar 1979, pp 559-566.**

# 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.

**PASTEURIZE BREAST MILK?** Should mothers be required to pasteurized their own milk before giving it to their babies?

**DISCRIMINATION:** Yet laws prevent mothers from obtaining raw milk to feed their babies should their own supply be inadequate.

# 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% |

*The Lancet*, Nov 17, 1984

## Reports of Food-Borne Illness in Raw Milk

**Several reports of pathogens "associated" with raw milk were published in the 1980s. But these reports failed to isolate the pathogen from the milk itself, or failure to account for other lifestyle variables of the persons becoming ill.**

**(Mann NR *Public Health Reports* 2001;103:5)**

**In the two decades between 1984 and 2002, reports of outbreaks associated with raw milk produced in the US are almost non-existent.**

**Dairy farmers are now managing for bacteria counts of less than 20,000/ml versus 100,000/ml in commercial milk.**

## Bias in Reporting Safety of Raw Milk

**OUTBREAK** of campylobacter infection in Atlanta, Georgia

**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."

*American Journal of Epidemiology*, 1983 Vol 114, No 4

## Bias in Reporting Safety of Raw Milk

**MEXICAN CHEESE:** Several incidences of food-borne illness from Mexican-style soft cheeses.

**BLAMED ON LACK OF PASTEURIZATION:** Officials claim that illness caused by lack of pasteurization.

**ACTUALLY DUE TO FAULTY PASTEURIZATION**: These cheeses were actually heated but not quite thoroughly pasteurized, so that the protective mechanisms were destroyed, but not all the pathogens. Officials refer to these cheeses as "raw."

**CASES of TB:** Several cases of TB among Mexicans consuming typical Mexican foods including soft cheeses have been blamed on the cheese without regard to other lifestyle factors. It is not even clear that TB can be contracted from milk products.

## Bias in Reporting Safety of Raw Milk

**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:** 70-75 persons ill. (CDC Website)

**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.

**LAB TESTS CLEAN:** Independent lab tests found no campylobacter in the milk.

## Bias in Reporting Safety of Raw Milk

**CDC Report:** In 2002, an outbreak of Salmonella Typhimurium was caused by the consumption of raw milk purchased at a dairy producing certified milk in Ohio.

**According to the CDC report :** "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."

There were many possible of vectors of illness on the dairy besides raw milk.

The dairy, which had been in business for decades without incident, caved in to health department pressure.

## Herd Management and Raw Milk Safety

**Consumers are avoiding commercial milk not only because it is pasteurized, but also because it comes mostly from cows kept in confinement, a situation that encourages poor health and disease (confinement cows live an average of 42 months versus 12-15 years for a cow on pasture.)**

**Dutch researchers found much lower rates of *Salmonella* infections in dairy herds and cows with access to pasture.**

**(Vaessen MA et al. Tijdschr Diergeneeskd 1998;123(11):349-51)**

# Raw Milk Production Today

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

- **Managed rotational grazing, ensures healthy cows**
- **Herd testing for disease**
- **Refrigerated bulk tanks**
- **Refrigerated transportation**
- **Easier milk testing techniques**

## Heat Resistant Pathogens in Pasteurized Milk

**Johne's bacteria (paratuberculosis bacteria)– Suspected of causing Crohn's disease, now routinely found in pasteurized milk:**

- ***B. Cereus*** **spores survive pasteurization**
- **Botulism spores survive pasteurization**
- **Protozoan parasites survive pasteurization**

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


# Modern Milk Production

**Highly industrialized, with many possibilities for contamination during and after processing.**

## Safety of Goat Milk and Goat Milk Cheese

**Amount of goat milk consumed in the US is about 160,000,000 gallons per year (conservative estimate), most of it unpasteurized**

**Raw goat milk and raw goat milk cheese is consumed in greater amounts than cows milk and cows milk cheese in many countries.**

**Despite widespread usage with or without the aid of refrigeration and pasteurization, goat milk has an impressive safety record.**

**The European Union has recognized the safety of raw unaged goat milk cheeses processed on the farm.**

**Raw goat milk has saved the lives of many babies who could not tolerate infant formula or cows milk.**

# Part Two:
# Health Benefits of Raw
# vs.
# Pasteurized Milk

## Proteins in Milk

**MILK PROTEINS:** Three dimensional, like tinker toys

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

**IMMUNE DEFENSE: Pasteurization and ultra-pasteurization flatten the three-dimensional proteins; 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.

## 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 ¾ pint raw milk per day; 5,000 given ¾ 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 3weight an 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.

## 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.**

## Effect of Commercial Pasteurization Temperatures on Vitamin Availability in Milk

| | |
|---|---|
| A | No significant change |
| B-1 | Down 3-20% |
| B-6 | Inactivated |
| B-12 | Down 10% but carrier proteins destroyed |
| Riboflavin | Heat stable, but light sensitive |
| Sodium | No significant change |
| C | Down 77% upon storage |
| D | Down, fortified |
| E | Down 15% |
| K | No significant change |

## Effect of Commercial Pasteurization Temperatures on Mineral Availability in Milk

| | |
|---|---|
| Selenium | Down 9.7% |
| Iron | Down 66% |
| Copper | Up 44% |
| Zinc | Down 69.4% |
| Sodium | No significant change |
| Potassium | No significant change |
| Calcium | Down 21% |
| Magnesium | No significant change |

# Other Health Benefits

**There are many non-vitamin components of milk that contribute to better health and growth and maturation in children.**

- **Nucleosides and nucleotides**
- **Polyamines**
- **Oligosaccharides**
- **Transfer proteins**
- **Peptides affecting coagulation and blood pressure**
- **Immunomodulatory peptides**
- **Antioxidants**

**Many of these components are heat labile, and are reduced or destroyed by pasteurization**

# Raw Milk Studies

**Children fed raw milk have more resistance to TB than children fed pasteurized milk.**
(*Lancet*, p 1142, 5/8/37)

**Pathological organisms do not grow in raw milk but proliferate in pasteurized milk.** (*The Drug and Cosmetic Industry*, 43:1:109, July 1938)

**Raw milk prevents scurvy and protects against flu, diphtheria and pneumonia.**
(*Am J Dis Child*, Nov 1917)

**Raw milk prevents tooth decay.** (*Lancet*, p 1142, 5/8/37)

**Raw milk promotes growth and calcium absorption.**
(*Ohio Agricultural Experiment Station Bulletin* 518, p 8, 1/33)

**Raw cream prevents joint stiffness.** (*Annual Review of Biochemistry*, 18:435, 1944)

**Raw milk protects against asthma and allergic skin problems.** (*Lancet* 353:1485, 1999)

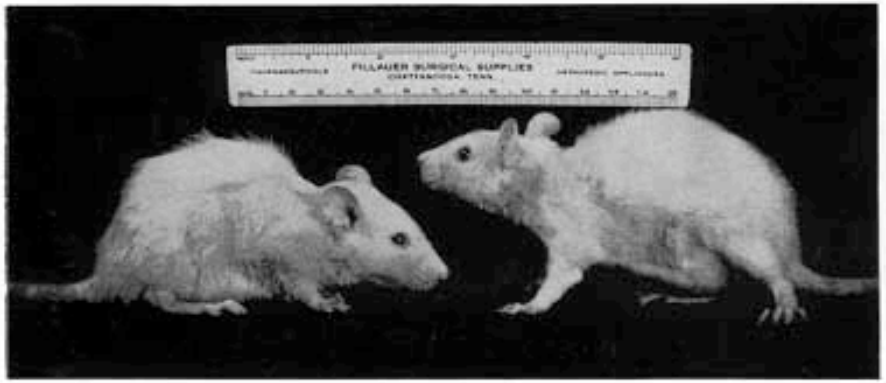
**After three generations on pasteurized milk, cats developed numerous health problems and pathologies of behavior. At four generations, all reproduction ceased.**
(*Pottenger's Cats,* 1983, Price-Pottenger Nutrition Foundation)

**Pasteurization destroys B complex, C, D, enzymes and whey proteins.**
(See numerous abstracts listed at www.realmilk.com)

# Studies on Raw vs Pasteurized Milk at Randleigh Farm, 1935-1940



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 $B_6$.

**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.**


## Internal Development, Raw vs Pasteurized

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

# Raw Milk vs. Pasteurized
# There IS a difference!

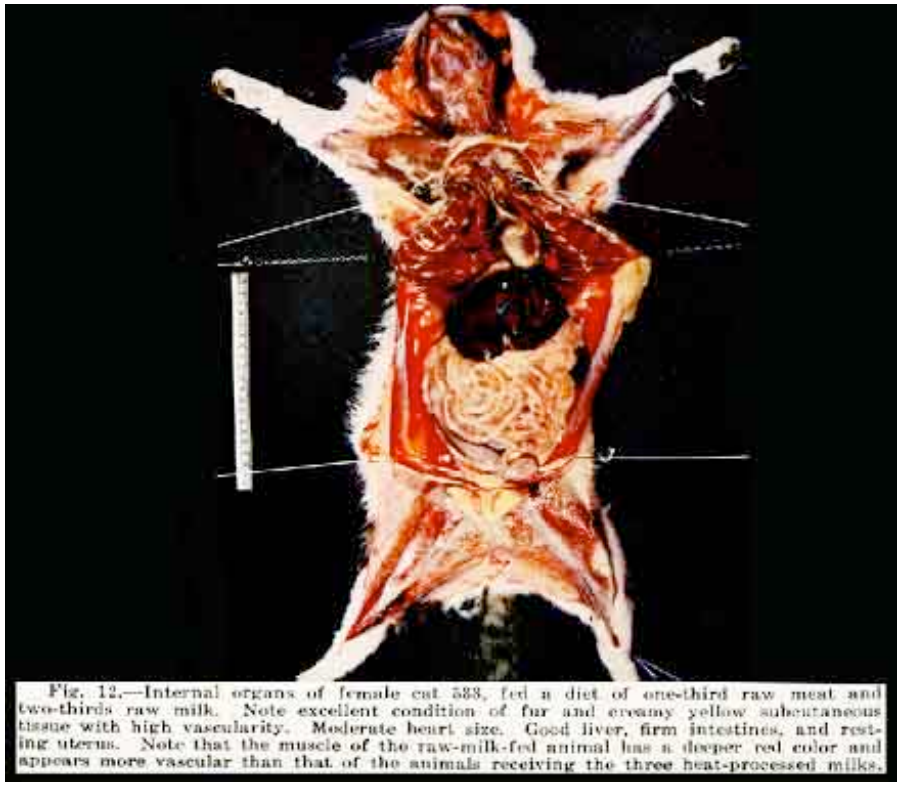


Fig. 12.—Internal organs of female cat 583, fed a diet of one-third raw meat and two-thirds raw milk. Note excellent condition of fur and creamy yellow subcutaneous tissue with high vascularity. Moderate heart size. Good liver, firm intestines, and resting uterus. Note that the muscle of the raw-milk-fed animal has a deeper red color and appears more vascular than that of the animals receiving the three heat-processed milks.

**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.**

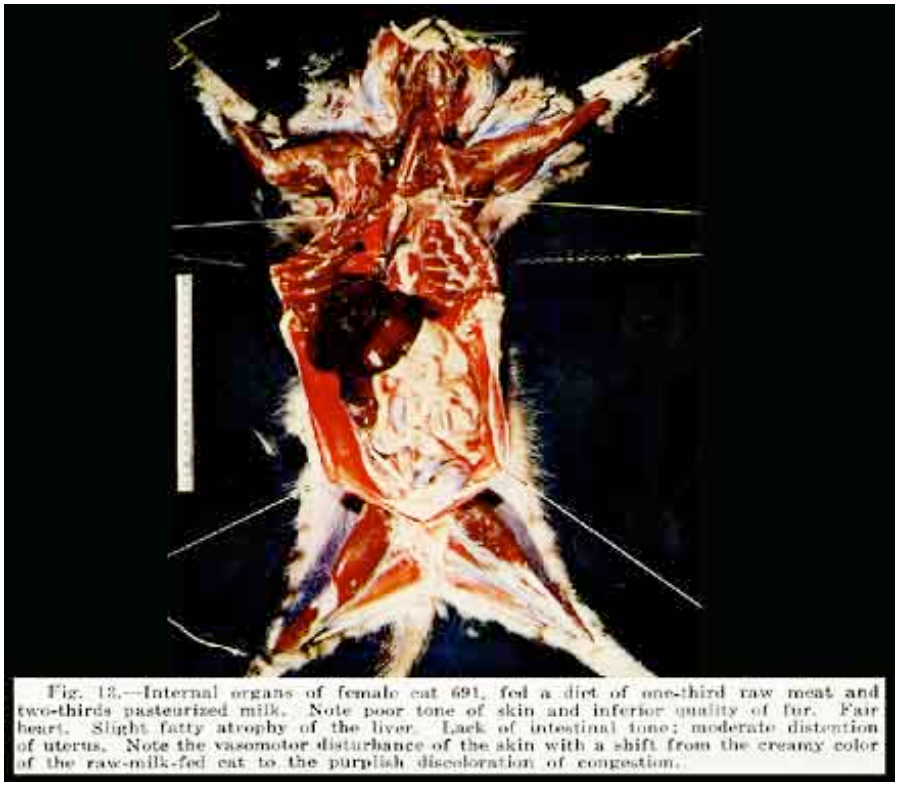


Fig. 13.—Internal organs of female cat 691, fed a diet of one-third raw meat and two-thirds pasteurized milk. Note poor tone of skin and inferior quality of fur. Fair heart. Slight fatty atrophy of the liver. Lack of intestinal tone; moderate distention of uterus. Note the vasomotor disturbance of the skin with a shift from the creamy color of the raw-milk-fed cat to the purplish discoloration of congestion.

**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.**

*Francis Pottenger lecture for Randleigh Farms.*

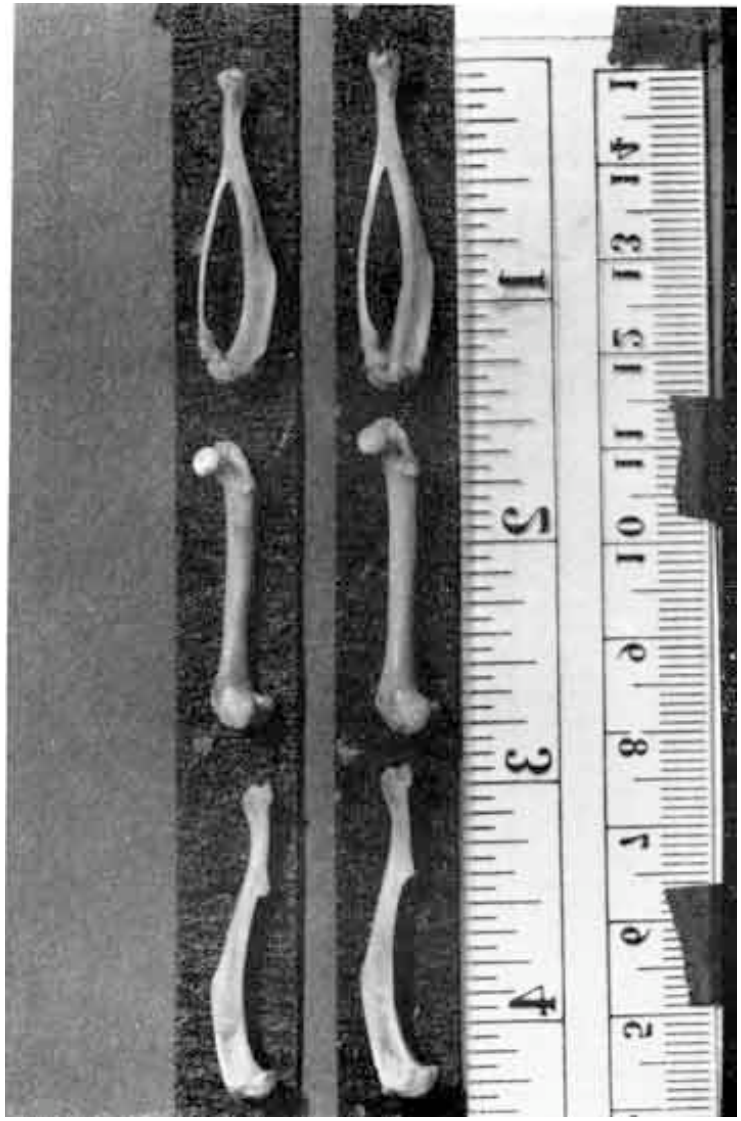
# Bone Development

Six-Month 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 Fibia

## Guinea Pig Studies of Dr. Rosalind Wulzen and Alice Bahrs, Department of Zoology, Oregon State College

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

***The Elixir of Life*, Arnold De Vries**

## Rat Studies of Dr. Ernest Scott and Professor Lowell Erf, Ohio State University

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

***The Elixir of Life*, Arnold De Vries**

# 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. Raw Milk Cures Many Diseases, www.realmilk.com

# Confinement Dairy System

**Cows never leave stalls.**
**Life span averages 42 months.**


## Feed Given to Confinement Cows

| Feed | Result in Milk |
|---|---|
| Soy | Allergenic soy protein and estrogenic isoflavones |
| GMO Grains | Aflatoxins (liver poisons) |
| Bakery Waste | Trans fatty acids |
| Citrus Peel Cake | Cholinesterase inhibitors (pesticides that act as nerve poisons) |
| Hormones and Antibiotics | Hormones and Antibiotics |

## Cows on Pasture

**Consume the food that cows are designed to eat (grass)**

**Healthy – need no antibiotics**

**Life span 12-15 years**

## Confinement versus Grass-Fed Butter

**Yellow color is a sign of much higher levels of vitamin A and CLA**

# Part Three:
# Economic Issues

## Conventional Dairy Farm Economics

**30 Cows Producing190 hundredweight of milk per year**

**Farmers receives about $10 per hundredweight – lowest price in 25 years**

**Gross income $57,000 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 $4 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 for eggs, broilers, turkeys, pork, beef, veal and broth = $50,000 with minimal input for feed, etc.**

**TOTAL INCOME $200,000 with much lower costs**

**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 – potential for huge rural revival.**

## The Wasteland


**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 into a commodity product.**

# Tourism

**Legalization of sale of wine at wineries made Virginia wineries economically viable and increased tourism income for the state.**

**Small farms, beautiful countryside and locally produced food are all important factors in a successful tourist economy**

**Recognizing the importance of a healthy farming community, the state of Pennsylvania has embraced raw milk sales and on-farm raw milk processing to encourage tourism in the state.**

**The state of Alabama has found that support of corporate farms and the decline of small farms has resulted in the disappearance of open fields, reemergence of woodlands and a decline in tourism. Tourists find the woods "spooky."**

# Part Four:
# Legal Issues

## Texas Ruling Struck Down State Provision Outlawing Raw Milk Sales Across State Border

**". . . The regulation not only prohibits Dexter [of White Egret Farm] from selling her milk in other states, it also prohibits citizens of other states from purchasing Dexter's milk unless those citizens personally travel to Dexter's farm in central Texas to make payment and accept delivery. The burden on interstate commerce is effectively absolute, and the restriction thus violates the Commerce Clause.**

**Texas State Court Ruling signed by the Commissioner of Health, November 2002**

## Potential for Abuse with Restrictive Laws Against Raw Milk

**In the White Egret Farm case, Texas dairy inspector Joe Dixon wrote an email to staff stating, "Where and all do we meet for the White Egret Cluster F***?" The law will be an invitation for bureaucrats to harass hard-working small farmers in a similar fashion.**

**Case of Esther Mahone of Hayter's Gap in Washington County, Virginia. Esther had been selling raw milk, butter and cottage cheese from her home for over 30 years. A recent call from the local dairy inspector so terrified her that she immediately sold her two cows and disposed of her inventory, taking away her livelihood. Mrs. Mahone was simply exercising her constitutional right to enter into a sales contract with other citizens.**

## Rights of Small Farmers

**The Fourteenth Amendment, Section 1: No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty or property without due process of law; nor deny to any person within its jurisdiction the equal protection of the law.**

**Small farmers are becoming organized. They know that:**

- **Inspectors and officials must abide by the Constitution**
- **Inspectors and officials can be sued individually**

# Rights of Consumers

**The Fourteenth Amendment, Section 1: No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty or property without due process of law; nor deny to any person within its jurisdiction the equal protection of the law.**

**We have a serious health crisis today, especially among our children. One in 150 children is autistic and even greater numbers suffer from serious allergies. In cases such as these, raw milk has been a life-saver, the only nourishing food that these children can tolerate.**

**Parents are becoming organized. Laws that prohibit the sale of raw milk and raw milk products violate the 14th amendment rights of themselves and their children to life, liberty and the pursuit of happiness. They know that**

- **Inspectors and officials must abide by the Constitution**
- **Inspectors and officials can be sued individually**

# Constitutionality

## Regulations Limiting the Sale of Raw Milk are Unreasonable and Do Not Provide Equal Protection Under the Law

**U.S. Constitution**

**Fourteenth Amendment**

# PMO Check-Rating Score

**The Virginia dairy department argues that sale of raw milk and milk products "has an impact on Virginia's PMO check-rating score, which is determined by the federal government. The check-rating score impacts the entire dairy industry whereby if the score falls below a certain point, then Virginia Dairymen will not be able to ship their milk out of state, having a detrimental impact on the entire dairy industry."**

**This issue is a red herring. The individual states do not need to follow the PMO. The PMO is a choice, not an obligation.**

**California, the top milk-producing state, does not follow the PMO but created its own regulations.**

**Furthermore, the State can accept the PMO but have exceptions in certain areas, as does Colorado.**

## Raw Milk Legal Status in Top 10 Milk Production States

1. California – 2903 million pounds in 2003 – Raw milk sales are legal in retail stores.
2. Wisconsin – 1852 million pounds in 2003 – In January, 2005, a raw milk bill was submitted to the Wisconsin legislature
3. New York – 1015 million pounds in 2003 – Raw milk sales are permitted on the farm.
4. Pennsylvania – 855 million pounds in 2003 – Raw milk sales are legal both on the farm and retail
5. Minnesota – 691 million pounds in 2003 – State Constitution stated in Article XIII, Section 7: Any person may sell or peddle the products of the farm or garden occupied and cultivated by him without obtaining a license therefore.
6. Idaho – 734 million pounds in 2003 – Raw milk sales are legal with a license
7. New Mexico – 565 million pounds in 2003 – Raw milk and raw milk products sales are legal both on the farm and in retail stores
8. Michigan – 511 million pounds in 2003 – Raw milk sales are illegal but the state condones cow sharing programs
9. Washington – 467 million pounds in 2003 – Grade A dairies may sell raw milk
10. Texas – 471 million pounds in 2003 – Raw milk sales are permitted

# Part Five:
# Trends in Various US States and Overseas

# Trends in Other States I

**Arizona** – A new dairy is gearing up for commercial raw milk distribution in Phoenix and Tucson. Retail sales permitted. Huge demand.

**California** – Raw milk widely available in health food stores

**Colorado** – Cow shares recently approved by 5-3 vote; legislation to legalize provision of on-farm raw milk was passed and signed by the governor.

**Connecticut** – Bill to ban raw milk sales voted down in committee several years ago. Raw milk available in stores.

**Oregon** – Raw milk shipped in from California now being sold in stores as pet food.

# Trends in Other States II

**Massachusetts** – Many new dairies selling raw milk from the farm; Raw milk has support of Northeast Organic Farmers Association.

**Michigan** – Several cow share programs attracting interest because of the financial advantages to farmers.

**Nebraska** – Legislation pending to allow advertising and delivery of raw milk and two-tiered processing regs of raw milk products; has support of the state Department of Agriculture.

**New York** – Many new farms selling raw milk. NY Department of Agriculture considering expanding scope of raw milk permits to include other raw dairy products (recognition that raw milk is good for local economies)

# Trends in Other States III

**Pennsylvania** – Current government very sympathetic to raw milk and on-farm processing. Encouraging more raw milk permits. Raw milk available for retail sale in stores.

**South Carolina** – Raw milk now for sale in some retail establishments.

**Texas** – Department of Agriculture defeated in attempt to shut down White Egret Farm goat dairy. Raw milk widely available through milk clubs.

**Washington** – The state Department of Agriculture has passed legislation removing the prohibition on producers hand-capping bottles. This makes it easier for small dairies to provide raw milk.

**Wisconsin** – About a dozen cow-share or herd-share programs throughout the state. Very popular with consumers and farmers.

# Other Trends

**European Union** – New regulations allow on-farm processing of un-aged raw goat cheeses and sales to restaurants and farmers markets.

**Europe** – Most European nations allow on-farm sales of raw milk and raw milk products.

**Internet** – Raw milk and raw milk products widely available on the internet.

## Suggested Reading

**Posted at Realmilk.com**

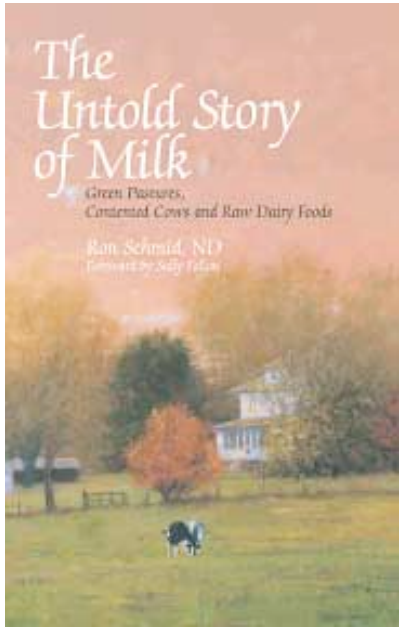
**"Saving the Raw-Milk Cheeses of Province" by Madeline Veidel**

**Abstracts on the Effect of Pasteurization on the Nutritional Value of Milk**

**"Raw Milk Cures Many Diseases" by JR Crewe, MD**

**Press Release, July 14, 2002: "Wisconsin Campylobacter Outbreak Falsely Blamed on Raw Milk"**

**"Francis M. Pottenger, MD, and the Hazards of a Health Fetish"**

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