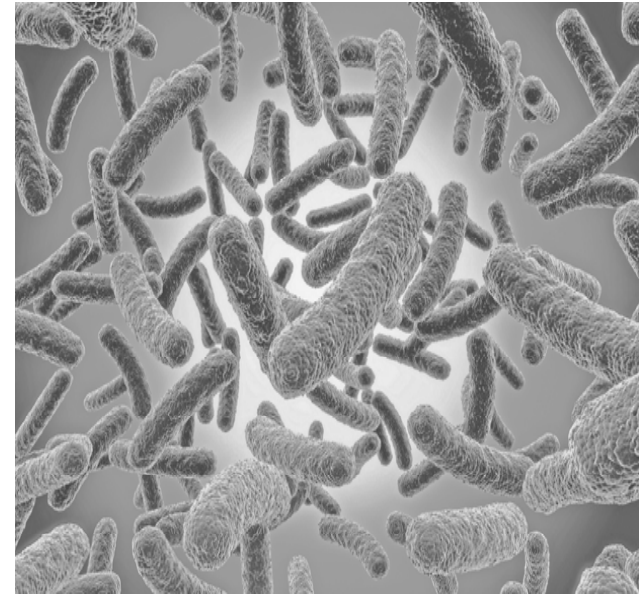


Those Pathogens, What You Should Know

Ted F. Beals, MS, MD



3rd International Raw Milk
Symposium, 2011 Short



We are at war over our Food

Most of us here are convinced that **what** we eat, and **why** we choose is our responsibility, not the responsibility of government.

They define the battlefield as RISK

But everything has risk

Its really about **Benefits** and Risks

Eating is not just an interesting thing we do, like riding in airplanes, it is an absolute necessity.

And many of us believe that our wellbeing is a direct consequence of our choices of food.

In the short time I have to present this material I will

Present the actual scientific facts

stripped of the *hysteria*

devoid of unsubstantiated Dogma

In a way that all of you will understand

This is not my “opinion” it is the actual scientific
information

The world is filled with bacteria

They are on our skin and in our digestive system.

They are absolutely essential to our development, our ongoing nutrition, and our health.

They are **not** determined to make us sick, they are just looking for a place to grow and divide.

- ✓ Bacteria outnumber people
- ✓ They were here long before us
- ✓ They will be here long after us
- ✓ They dominate the diverse bio-culture of the world
- ✓ Our existence is integrated with them

All of the bacteria that are in our world today have succeeded over a long period of history to find nice places to grow and divide.

When we came along, a small number of them found that humans have some nice places to grow and divide.

The ones that came to live with us, either just co-exist, or we have actually learned to use their presence to our advantage.

A remarkable few that found nice places inside us, may cause side effects when they grow and multiple.

Whole world: hundreds of thousands of different kinds, Million trillion trillions of individual bacteria

Those associated with people:

Hundreds of different kinds.

More bacteria on & in our bodies than we have cells of our own.

Beneficial bacteria: Hundreds of kinds

Bacteria that might make people sick:

A couple of dozen.

The official naming system:

- Genus and Species. Examples:

Listeria monocytogenes

- However there is abundant diversity within these “officially named” categories:

Subtypes: serotypes, genotypes, strains, forms, serovars, varieties, isolates:

example: *Escherichia coli* O₁₅₇:H₇

All bacterial named with genus and species
have subtypes !

A critical MYTH of the risk-mongers

All of the supposed subtypes in a named (genus species) of bacteria are the same.

They want you, judges, legislators, journalists: to believe that if a named bacteria (genus and species) has been associated with some disease, all of the subtypes of that genus and species are BAD they simply call them “pathogens”.

Thousands of researchers, hundreds of books and thousands of published articles in scientific journals, all recognize the scientific fact that this simply is NOT TRUE.

But the risk-mongers understand that their horror stories crumble in the face of truth, scientific facts and reality. So they keep repeating this myth to journalists, legislators, and judges. Every time they say anything about possible illness, they repeat this myth

Some even imply that ALL bacteria are **BAD**

Let's now take a brief look at each of the four dreaded "pathogens". What you should know

1. Where do they like to grow?
2. Most common SOURCE (where they multiply in large numbers)
3. Most common RESEVOIR (where they exist)
4. Things that increase potential risk to raw milk drinkers
5. Things that decrease potential risk to raw milk drinkers
6. Overall human public health impact
7. Specific public health impact of drinking milk raw

Campylobacter jejuni

- Where does it like to grow: **Grows only inside living animal cells**
- Most common SOURCE: **Poultry**
(they are not sick, they are “carriers”, feces & meat)
People with diarrhea from virulent forms of campylobacter
- Most common Reservoir: **Water contaminated from poultry manure (if shedding)**
- Things that increase risk to drinkers: **Drinking really fresh milk.**
- Things that decrease risk to drinkers: **Storage time, exposed to air. Keeping poultry and people that carry campylobacter, away from milk processing**
- Overall human public health impact: **Second most common cause of all foodborne illness. There are extremely rare severe complications.**
- Specific public health impact of drinking raw milk: **CDC estimates an annual average of more than **Eight-hundred thousand** (845,024) people in the USA have domestically acquired diarrhea caused by food contaminated with *Campylobacter jejuni*; on average **34** were attributed to drinking raw milk.**

The most common virulent pathogen currently associated with raw milk outbreaks

Shiga Toxin producing *E. coli* (*E. coli* O₁₅₇:H₇)

- Where does it like to grow: **Intestinal tract of warm blooded animals**
- Most common SOURCE: **Infected humans** (fecal)
- Most common Reservoir: **Cattle/cows** that are shedding colonized virulent subtypes
- Things that increase risk to drinkers: ☞ **Dairy animals contaminated with feces from high-shedding animals.** ☞ **Milk handlers shedding during and after infection**
- Things that decrease risk to drinkers: ☞ **Closed herds,** ☞ **keeping people that are shedding away from milk processing and herds.**
- Overall human public health impact: **Small but highly publicized because of hemolytic uremic syndrome**
- Specific public health impact of drinking raw milk: **CDC estimates an annual average of more than **Sixty three thousand** (63,153) people in the USA had domestically acquired diarrhea caused by food contaminated with *E. coli* O₁₅₇:H₇; on average **5** were attributed to drinking raw milk.**

Listeria monocytogenes

- Most serious and deadly of the contemporary foodborne pathogens.
- Much is known about the virulence factors that are necessary before causing disease
- Ubiquitous in our environments:
- Present in poorly managed silage, in facilities that process ready-to-eat foods, in our homes, on our bodies
- **The public ingests *Listeria* on a regular basis without becoming ill.**
- You must ingest huge numbers of virulent *Listeria* to cause gastroenteritis.
- Is a significant health problem in domestic animals
- Systemic disease is similar in different animals, but the subtypes that cause disease in different animals is often different

Those who wish to ban all milk that is not pasteurized use the horrors of *Listeria monocytogenes*' systemic diseases to support their cause.

They consistently broadcast the high mortality and focus on the susceptibility of women who might be pregnant, fetuses, newborns and the elderly.

However

***Listeria monocytogenes* has never been a significant public health risk from drinking fresh raw milk.**

Listeria monocytogenes

- Where does it like to grow: can alternate between two growing modes:
 - 1) grows **within** animal cells
 - 2) or can switch to growing in decomposing plant materials.
- Most common SOURCE: Poorly managed silage. Infected animal products of conception. Processing plants & their equipment.
- Most common Reservoir: The environment, particularly if cool, wet and undisturbed
- Things that increase risk to raw milk drinkers. **Not a risk**
- Things that decrease risk to raw milk drinkers: **Not a risk**
- Overall human public health impact: **Severity of systemic disease.**
The most serious public health risk:
 - **Ready-to-eat PROCESSED foods particularly meats.**
- Specific public health impact of drinking raw milk: CDC estimates an annual average of
 - **1 ½ Thousand (1,591)** people in the USA have systemic infections caused by food contaminated with *Listeria monocytogenes*;
there have been **NO** cases attributed to drinking raw milk in the last 12 years.

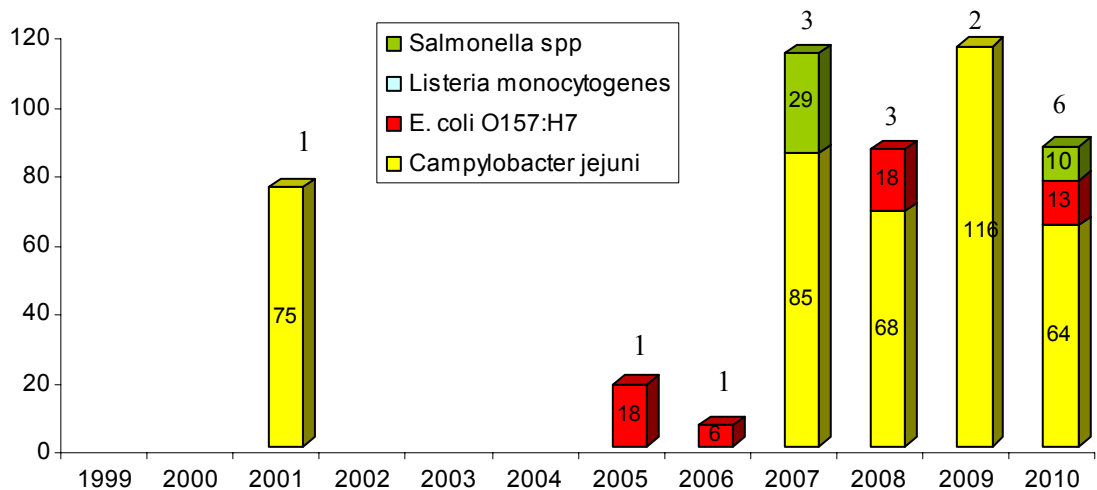
Salmonella spp.

- Where does it like to grow?: Inside animal cells. But also in food and feed with high protein content when stored warm.
- Most common SOURCE: Infected humans and animals; Animal feeds, re-warmed foods that have been contaminated.
- Most common Reservoir: Contaminated water
- Things that increase risk to drinkers: Inadequate refrigeration
- Things that decrease risk to drinkers: Eliminate sources
- Overall human public health impact: **The most common foodborne illnesses**
- Specific public health impact of drinking raw milk: CDC estimates an annual average of more than **1 million** (1,027,561) people in the USA had domestically acquired diarrhea caused by food contaminated with *Salmonella*; on average **3** were attributed to drinking raw milk.

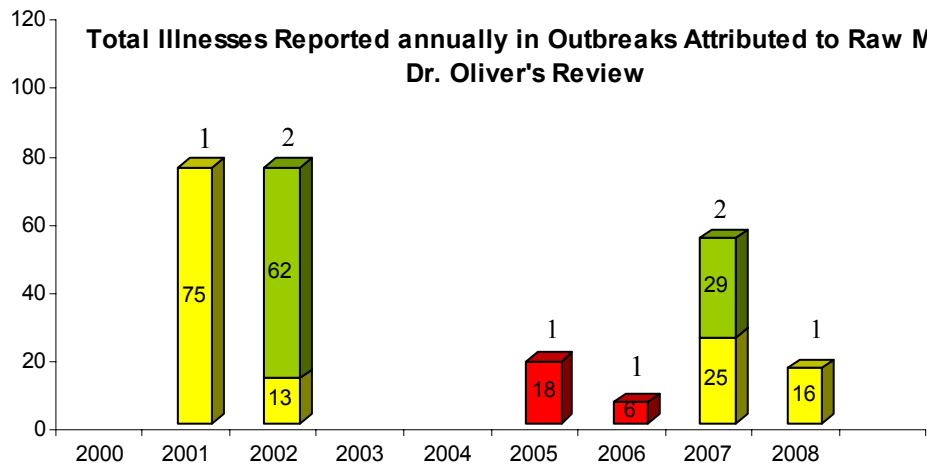
Reality Check on Relative Risk

- ✓ My personal risk specific to the consumption of raw milk:
- ✓ The relative risk of Fluid Raw Milk consumption in the USA:

**Reported Illness Attributed to Raw Fluid Milk Consumption
Dr. Beals' Comprehensive Database 4/25/2011**

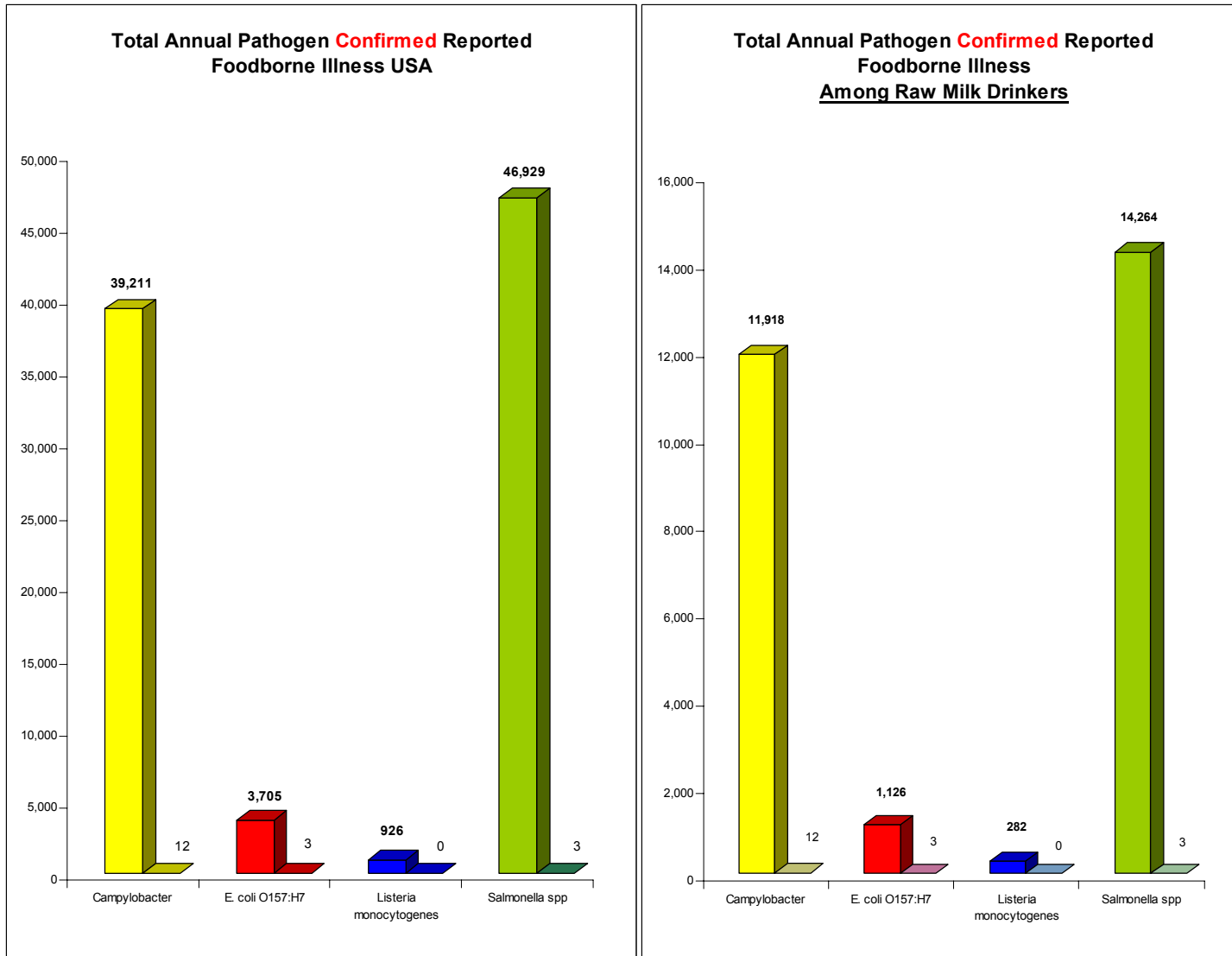


**Total Illnesses Reported annually in Outbreaks Attributed to Raw Milk
Dr. Oliver's Review**



Numbers inside bars are illnesses

Numbers at the top of bars are number of incidents



In each pair, the left is all food, the right those attributed to drinking fresh unprocessed whole milk

Most Up-to-date Statistics Human gastrointestinal illnesses in USA

- 217,973,045** Total diarrheal episodes annually USA: (2008) [CDC]
- 48,000,000** Total Foodborne illnesses annually USA: (1 of 6 people)
- 1,937,561** Annual foodborne infections from the 4 “pathogens”
(all foods)

Average annual illnesses attributed to investigated incidents of fluid raw milk consumption:

- 42** people reported ill per year (Dr. Beals, 1999 – 2011)
- 27** people reported ill per year (Drs. Oliver et al, 2000 – 2008)

9,385,864 Total consumers of raw milk in USA: (2010)
(3.04% of the US population from very large phone survey by FoodNet)

From the perspective of a National Public Health professional looking at an estimated total of **48,000,000** foodborne illnesses each year;

or

From the perspective of a healthcare professional looking at a total of **90,771** confirmed bacterial foodborne infections each year;

- There is no rational justification to focus national attention on raw milk which may be associated with an average of **42** illnesses among the more than 9 million people who have chosen to drink milk in its fresh unprocessed form

❖ It is **Irresponsible** for a senior national government administrator to testify that because of those 42 people, raw milk is inherently hazardous, parents should not be allowed to decide which foods they serve their children and milk should be banned across the nation unless it has been pasteurized.

Under FDA's 1st amendment to the US Food Code after enactment of the Food Safety Modernization Act.

The criteria that the FDA needs in order to keep food away from the public, changes from:

➤ “finds **there is credible evidence** or information indicating that the article of food present a threat of serious adverse health consequences or death to humans or animals.”

to

➤ “**believe** that an article of food is adulterated or misbranded.”

Thank you for your attention

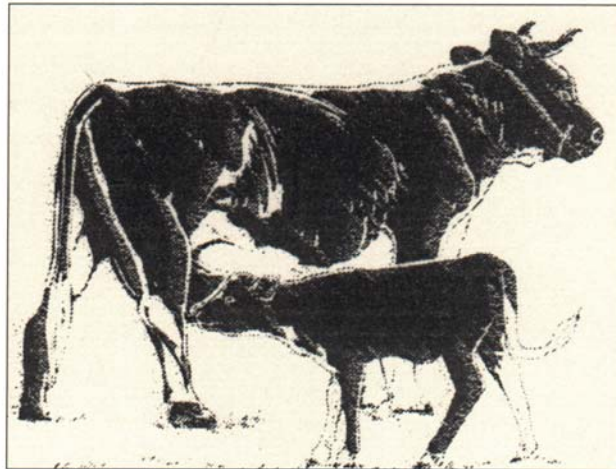
If there is time I will answer some questions.

Otherwise see me at one of the breaks, or
ask during the panel discussion this
afternoon



Safe Handling – *Consumers' Guide*

Preserving the Quality of Fresh, Unprocessed Whole Milk



by Peggy Beals, RN

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