

Testimony to the Vermont Legislature

Orleans Veterinary Service, Inc.

Specializing in Livestock



Photo courtesy of USDA NRCS

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Milk

“One-stop shopping for nutrition”

- Protein
- Lactose (milk sugar)
- Fats
- Fluid
- Minerals & Vitamins



Milk Quality Tests

- SPC – Standard Plate Count
- (equipment)

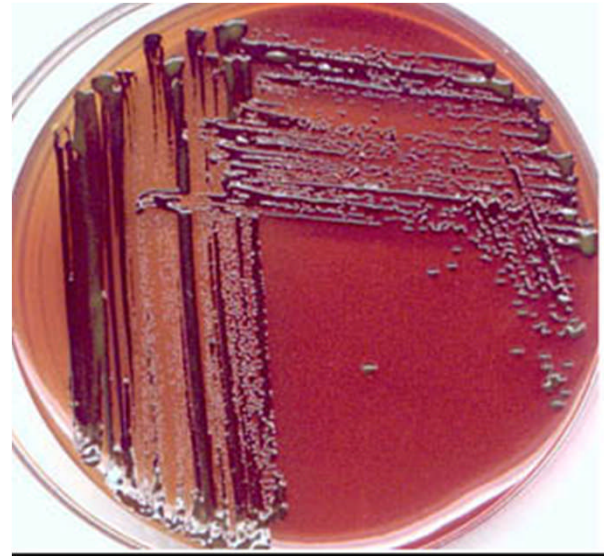
- PIC – Preliminary Incubation Count
- (cows)

- NEVER ZERO

Milk

Excellent Bacterial Growth Medium

- Food
- Moisture
- Warmth
- Time



Raw Milk

Why should we be concerned?

- Transportation
- Storage
- Emerging bacterial strains

National Highway Traffic Safety Administration (NHTSA)



83° F

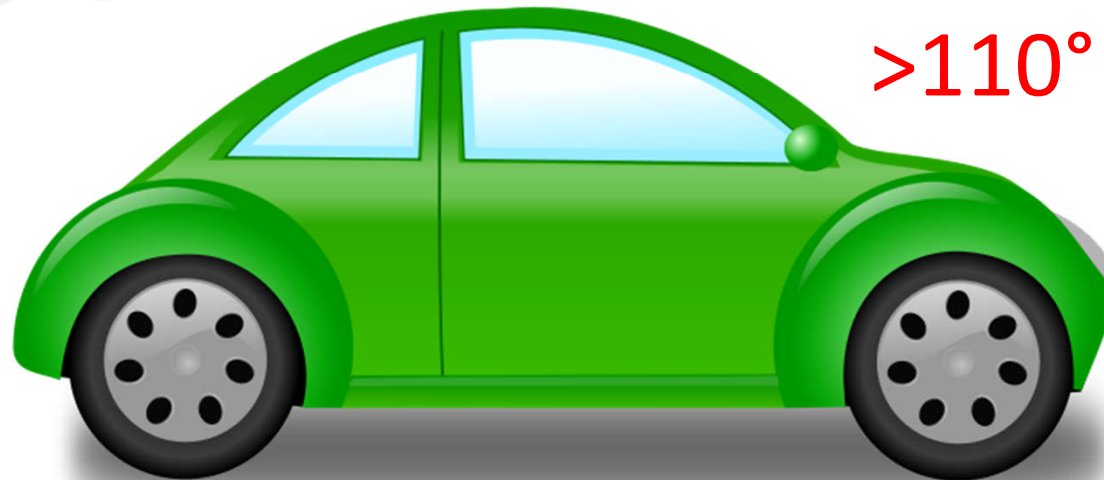


109° F – 15 min

National Highway Traffic Safety Administration (NHTSA)



60° F



>110° F

Optimal Temperature for Bacterial Growth

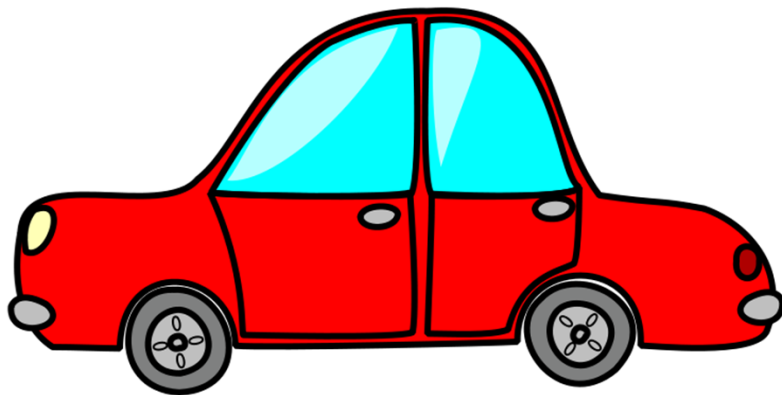
- 41-113°F



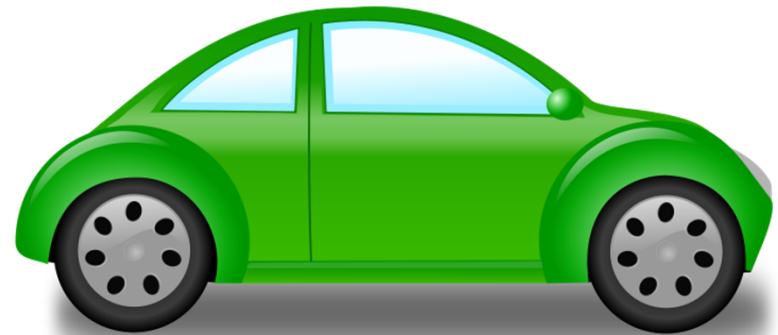
Car temperatures



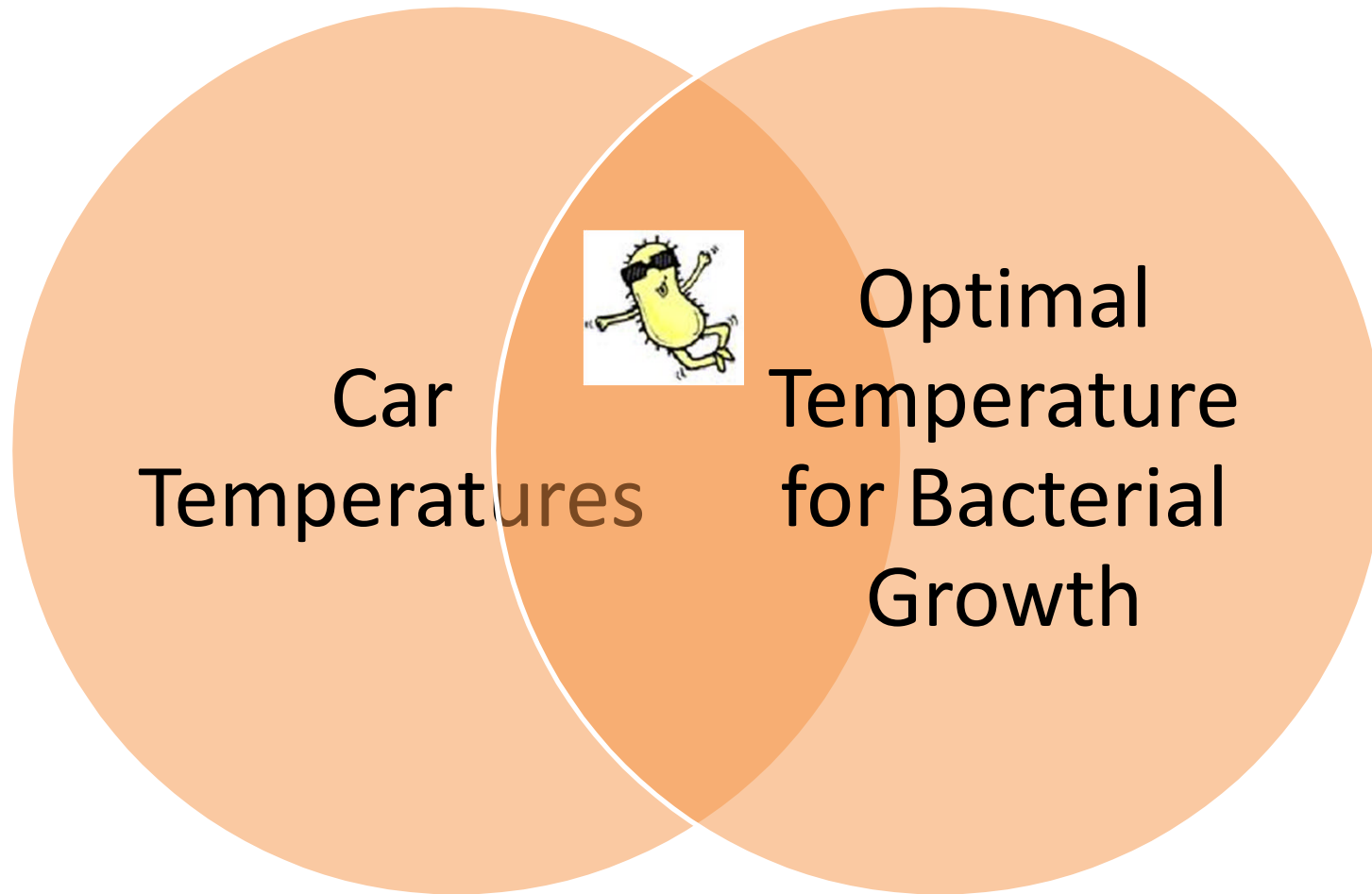
109°F



>110°F



Happy Bacteria



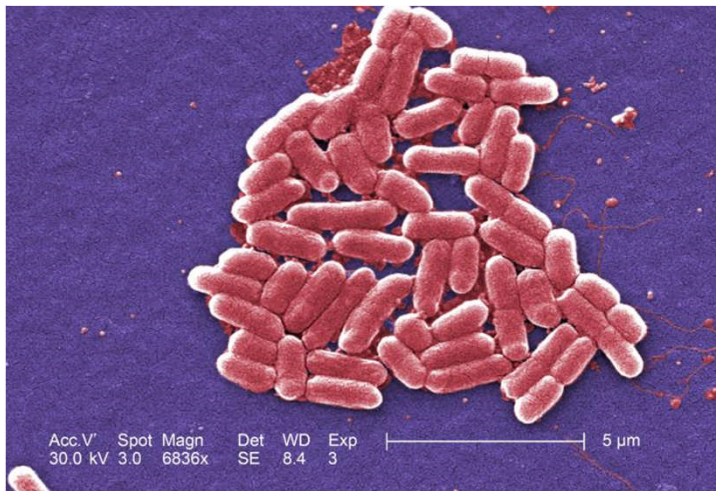
Car
Temperatures

Optimal
Temperature
for Bacterial
Growth

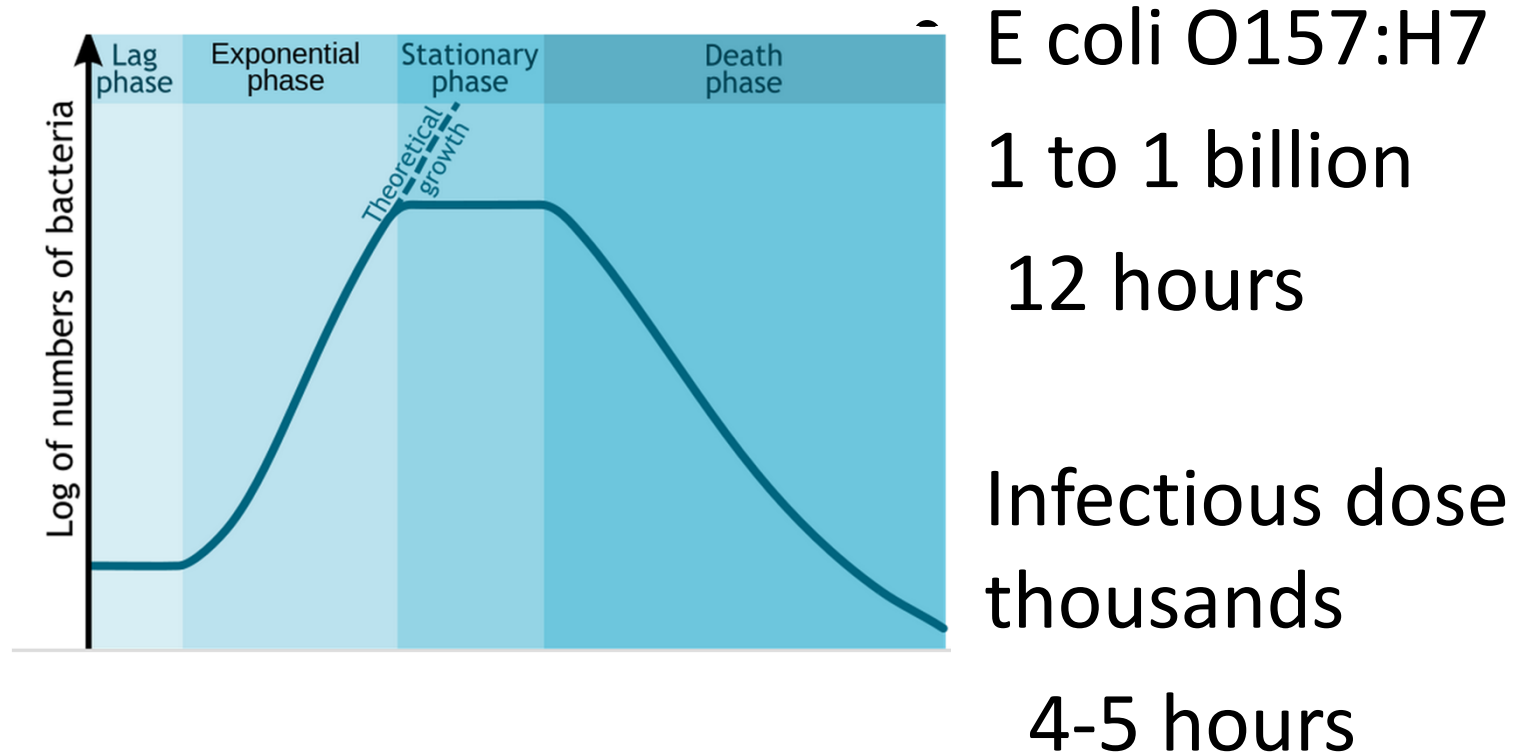


Bacterial Generation Time Time for Population to Double

- E. coli
- 16 minutes
- Salmonella
- 50 minutes



Bacterial Growth at Optimal Temperature



E coli O157:H7

- Causes severe diarrhea
- Can cause kidney failure (Hemolytic Uremic Syndrome)
- Can cause death
- Young children particularly vulnerable

Italian Study 2012

- “...failure to maintain the cold chain carries significant implications for the risk of E. coli O157:H7 infection and HUS [hemolytic uremic syndrome].”

Giacometti, F., et al. (2012). Foodborne pathogens in in-line milk filters and associated on-farm risk factors in dairy farms authorized to produce and sell raw milk in northern italy . *Journal of Food Protection*, 75(7), 1263-1269.
doi:10.4315/0362-028X.JFP-12-028

Milk Storage



Emerging/Recognized Pathogens

- E coli O157:H7
- 1st recognized in human disease in 1982
- One of top 3 pathogens in raw milk

Emerging/Recognized Pathogens

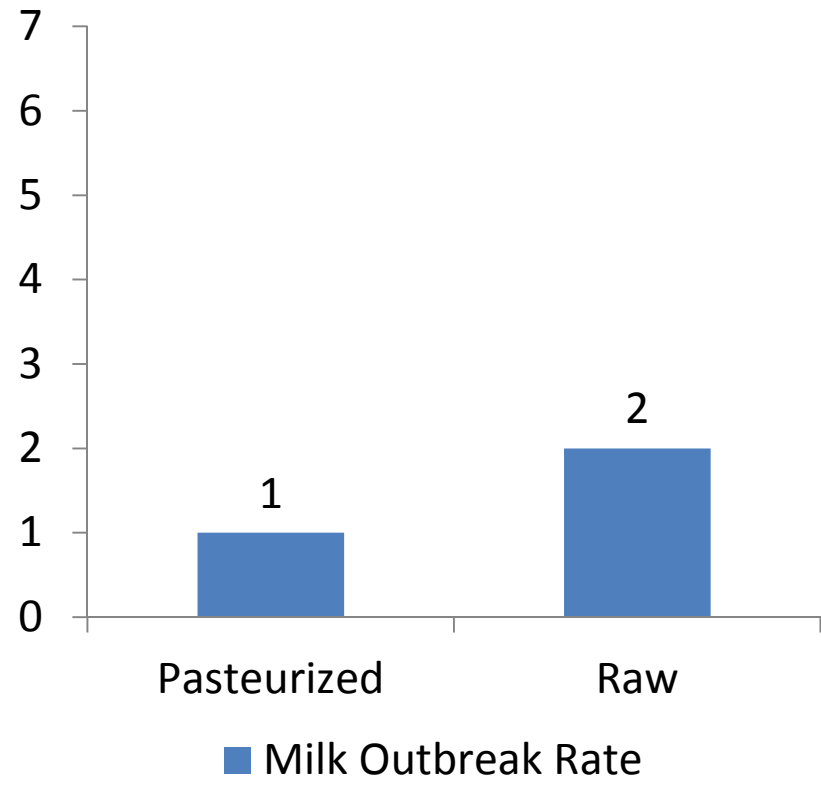
- MDR Salmonella
- Salmonella one of top 3 pathogens in raw milk
- Severe diarrhea

Emerging/Recognized Pathogens

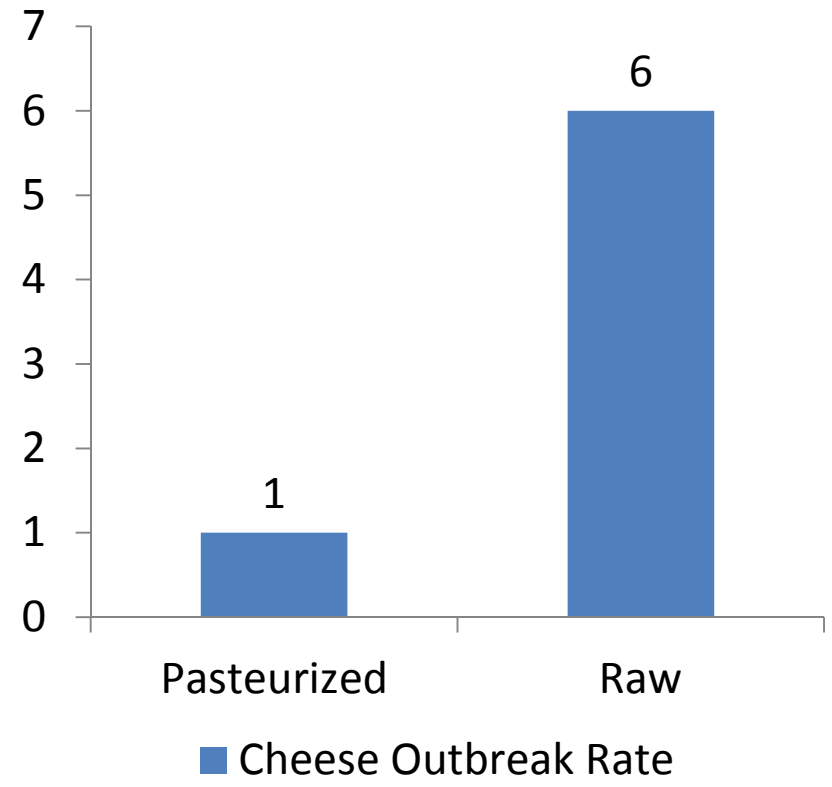
- *Campylobacter jejuni* – antibiotic resistant strains now common
- Most common pathogen in raw milk
- Can cause Guillain-Barre syndrome

State with Legal Sales of Raw Dairy Products

Rate of Disease Outbreak due to Milk



Rate of Disease Outbreak due to Cheese



Raw Milk Outbreaks 2009-2014

- Have nearly doubled
- 8 of 10 cases occur in states with legal sales
- Kidney failure (HUS)
> 12 cases
- Paralysis
(Guillain Barre)
2 cases

Sporadic Disease

Minnesota Dept. of Health 2013

“...number of sporadic raw milk–associated illnesses is likely substantial, greatly exceeding the number of cases linked to recognized raw milk–associated outbreaks. “

Sporadic Disease

Minnesota Dept. of Health 2013

“Furthermore, the number of cases associated with reported raw milk consumption appears to be increasing, just as the movement to relax regulation of raw milk sales appears to be gaining momentum in many states.”

Sporadic Disease

Minnesota Dept. of Health 2013

- Young children disproportionately affected
- Raw milk often from their own farm
- HUS occurred in 21% of E coli infections
- 1 child died

Robinson TJ, Scheftel JM, Smith KE. Raw milk consumption among patients with non-outbreak-related enteric infections, Minnesota, USA, 2001–2010.

Emerg Infect Dis [Internet]. 2014 Jan [4/10/2014].

<http://dx.doi.org/10.3201/eid2001.120920>

(<http://dx.doi.org/10.3201/eid2001.120920>)

(<http://www.cdc.gov/Other/disclaimer.html>)