2013 REPORT TO THE NATURAL RESOURCES, AGRICULTURE & ENVIRONMENT INTERIM COMMITTEE and the HEALTH & HUMAN SERVICES INTERIM COMMITTEES

Prepared by the Utah Department of Agriculture and Food and the Utah Department of Health

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UNPASTEURIZED MILK-ASSOCIATED DISEASES IN UTAH

I. Purpose and Summary:

The Utah Code, Title 4-3-14(7) required the Utah Department of Agriculture and Food (UDAF) and the Utah Department of Health (UDOH) to report to the Natural Resources, Agriculture and Environment Interim Committee and the Health and Human Services Interim Committee in 2008 and 2009. The report was to communicate health problems in Utah resulting from the sale of unpasteurized, or raw, whole milk at self-owned retail stores. Although no longer required, this report will continue to be produced annually on the illness associated with the production of unpasteurized milk. Unpasteurized milk consumption continues to be associated with severe illness and even, though rare, death in Utah.

II. Background and Overview

Unpasteurized (raw) milk consumption is a recognized risk factor for diarrheal illnesses due to bacteria such as *Campylobacter*, *Salmonella*, and Shiga toxin-producing *E. coli* (STEC) including *E. coli* O157:H7. Other diseases potentially transmitted through unpasteurized milk include brucellosis, *S. aureus* infection, tuberculosis, Q fever, listeriosis, yersiniosis, toxoplasmosis, and rabies.

Physicians, laboratories, and other entities that identify these infections are required to report them to their local health department or UDOH. Public health investigators then interview cases for food, travel, water, and animal exposure history, as well as other risk factors to determine a possible source of illness. In addition to consumption of unpasteurized milk and products made with raw milk, other common risk factors for diarrheal illnesses include eating improperly cooked animal products or foods contaminated by animal products, drinking untreated water, handling livestock, contact with reptiles and amphibians, and household or close contact with someone who has diarrheal illness.

III. Utah Dairy Act

The UDAF currently has four different dairy farm permits:

1. Sell Grade A unpasteurized milk to a Grade A plant for pasteurization, then sold as fluid milk (Title 4-3-10(2)).
2. Sell Manufacturing Grade milk to a plant for pasteurization, then manufacture dairy products (e.g. cheese, ice cream, dry milk) (Title-4-3-10(2)).
3. Sell unpasteurized milk, must be bottled and sold on the premises (Title 4-3-14(2)).
4. Sell unpasteurized milk, may be bottled and sold at retail establishment off premises (Title 4-3-14(3)).

The last two permits are the only legal means by which unpasteurized milk may be sold for human consumption in Utah. In 2007, the Utah Legislature approved an expansion to the means by which unpasteurized milk may be sold in Utah. This expansion allowed authorized dairies to transport their unpasteurized milk to an off-site retail store owned and operated by the dairy (permit listed as 4 above) and sell it to the public.

IV. Raw Milk Products

Raw milk products are regulated differently than raw milk. Raw milk products include items such as yogurt, cottage cheese, cheeses, whipping cream, cheese curds, sour cream and similar items produced from raw milk. Raw milk products are not allowed to be sold in Utah, except for raw milk brick cheese.

Utah Administrative Code R70-330, the Raw Milk Rule, states that "Raw milk brick cheese held at 35°F for at least 60 days may be sold at retail stores or for wholesale distribution, at locations other than the premise where the milk was produced." (R70-330-5F) As long as raw milk brick cheese is prepared as stated, and is prepared at a facility permitted and inspected by UDAF, it may be sold legally at any retail facility.

The Rule further states that "All milk products made from raw milk including, but not limited to: cottage cheese, buttermilk, sour cream, yogurt, heavy whipping cream, half and half, butter and ice cream shall not be allowed for sale in Utah." (R70-330-5G). These products are risky because they have not been pasteurized and they undergo more complex processing than the raw milk they are made from. For example, in the "Mr. Cheese" *Salmonella Newport*

outbreak mentioned in Section VII of this report, cheese was made from raw, unpasteurized milk; rather than being immediately cooled and aged as raw milk cheese intended for consumption would be, the milk was processed at room temperature into cheese blocks that were sold to consumers without being held for 60 days.

V. Health Problems Associated With or Resulting From the Sale of Unpasteurized Whole Milk at Self-Owned Retail Stores.

There are currently five self-owned retail stores selling unpasteurized milk in Utah. They are located in Orem, Heber City, Pleasant Grove, St. George, and, as of 2013, in Sugarhouse. The stores in Heber City, Orem, Sugarhouse, and St. George are owned by the same dairy. In 2011, one outbreak of human illness was associated with milk sold at one of these stores. Details about this outbreak are described in Section VII of this report. The dairy and stores are currently in compliance with regulations.

In 2011, 43 cases of illness (*Campylobacter* and *Salmonella*) were reported in Utah that were possibly associated with the consumption of unpasteurized milk. Approximately half of these cases reported the source of unpasteurized milk as a dairy or dairy-owned retail store; other sources included family and friends, family farms, and unknown sources.

Although a low percentage of ill persons report consuming unpasteurized milk annually, there are several factors that may contribute to the under-reporting of raw milk consumption. These factors include: 1) research has demonstrated that infections with enteric organisms are incompletely diagnosed and reported to public health; 2) patrons of these stores might decline to provide information about the source of their milk in order to protect that source from public health or similar action; and 3) identification of exposure to unpasteurized milk and of the sources of that milk depend on investigations conducted by Utah's local health department (LHD) investigators, and inadequate local public health resources often limit the timeliness and completeness of those investigations.

VI. Prevention and Collaboration

The UDAF and the UDOH have implemented a procedure for timely investigation and sharing of information between the two agencies regarding these cases. The goal of our response is to rapidly discontinue public access to contaminated unpasteurized milk, should evidence of

such contamination be detected. Currently, UDAF notifies UDOH of any dairy that has a coliform count greater than one. UDOH then notifies the LHD with investigatory jurisdiction over that dairy. This allows several agencies to be notified early on of any potential risk of exposure.

Increased collaboration has led directly to improved services. For example, in 2010, the UDAF became aware of a cluster of *Campylobacter* infections in Weber County from UDOH surveillance; the UDAF conducted an investigation which discovered an unpasteurized milk handling flaw at a dairy. This flaw would not have been observed under normal circumstances.

VII. Summary of Unpasteurized Milk Associated Outbreaks In Utah, 2003-2012 (YTD).

2003

No outbreaks reported associated with unpasteurized milk.

2004

No outbreaks reported associated with unpasteurized milk.

2005

In September 2005, a local clergyman visited a group treatment home for youth in Bear River to perform services. He also provided brownies, cookies and milk. The milk came from his farm and was unpasteurized. A total of 11 persons were diagnosed with *Campylobacter* (six laboratory-confirmed).

In October 2005, five Arizona cases and two Utah cases of Campylobacter reported drinking unpasteurized milk from a dairy in Colorado City, Arizona. The Arizona Department of Health Services recovered Salmonella from unpasteurized milk from the dairy. There were no cases of salmonellosis associated with the milk. (Note: *Campylobacter* is notoriously difficult to recover from milk, and was not recovered from this milk.)

An outbreak of campylobacteriosis occurred among students of a Salt Lake County veterinary technician training class that visited a dairy farm in Juab County in October 2005. Sixteen students attended the class; eight drank unpasteurized milk, of whom two or three became ill. *Campylobacter* was recovered from the stool of one of those ill.

2006

Two additional cases of *Campylobacter* were identified in February and March of 2006 that consumed unpasteurized milk from the same dairy in Colorado City, Arizona that was implicated in an investigation in October of 2005.

2007

An outbreak of campylobacteriosis occurred in Utah County associated with unpasteurized cow and goat milk from a local dairy. Approximately 26 confirmed cases were associated with the outbreak. A case-control study was conducted to evaluate the outbreak and to test the hypothesis that unpasteurized milk was the source of infection; consuming unpasteurized milk from the dairy was found to be significantly associated with illness.

2008

An outbreak of campylobacteriosis occurred in Bear River and Weber-Morgan Health Districts. Four confirmed cases were associated with the outbreak. All cases purchased unpasteurized milk at a dairy in Ogden. At the dairy inspection, the UDAF identified weaknesses in production procedures and worked with the dairy to correct the problem in a timely manner.

2009

No outbreaks associated with unpasteurized milk or unpasteurized milk products were reported in 2009.

2010

In spring 2010, an outbreak of campylobacteriosis occurred in the Weber-Morgan Health District. From February to June 2010, 10 laboratory-confirmed cases reported consuming unpasteurized milk from a dairy in Weber County. During that same time period, the dairy voluntarily suspended sales three times and received two formal suspensions for exceeding the threshold limit in coliform counts from UDAF. No new cases have been reported since May 2010.

From April 29, 2010 to June 3, 2010, a total of 10 *Salmonella newport* cases were reported to UDOH; all 10 patients had consumed unpasteurized milk from Store A (seven patients) or Store B (three patients). A dairy in central Utah is licensed to sell unpasteurized milk; Dairy A owns and sells unpasteurized milk at Store A and Store B. Cultures of frozen, unpasteurized milk samples stored at Dairy A from batches of milk sold during the outbreak period yielded S. Newport isolates indistinguishable by PFGE from the outbreak strain. An

inspection of Dairy A on May 7, 2010, did not reveal any obvious sources of contamination. On May 12, 2010, on the basis of coliform test results within legal limits, the dairy was permitted to resume sales of unpasteurized milk. No additional cases have been reported to UDOH.

2011

One cluster of *Campylobacter* illness was reported in Utah County Health District; illness was associated with consumption of unpasteurized milk from a local dairy.

A cluster of Salmonella illnesses was possibly associated with consumption of raw milk and queso fresco made with raw milk. There were 46 cases associated with this cluster in 2011; this Salmonella type has been identified in cases in Utah on an ongoing basis since 2009. The distributor of the queso fresco was identified and samples from the facility were PFGE matched to the outbreak pattern. That distributor was given a cease and desist letter and fine by UDAF in October 2011.

2012

There were four *Campylobacter* clusters associated with liquid raw milk affecting a total of 23 people from Utah, and one person each from Texas, Wyoming, and Arizona in 2012.

Two clusters of Campylobacter were reported in the Weber-Morgan Health District; illness was associated with consumption of unpasteurized liquid milk from a local dairy located in Weber County. Two laboratory-confirmed cases and two probable cases were identified in early spring. These persons consumed unpasteurized milk from the same dairy. Later in the year, there were nine more laboratory-confirmed and three more probable cases associated with the same dairy. UDAF inspected the dairy and took environmental samples, however no samples tested positive for *Campylobacter.*

A third cluster of *Campylobacter* cases was identified with two laboratory-confirmed cases and six probable cases, including a Texas resident. This cluster was associated with a dairy in Wasatch County. At least 60% of the ill persons regularly drank raw milk from the implicated dairy. The permit to sell raw milk was pulled by UDAF due to a high coliform count, but was reinstated in the same weekend after the dairy cleaned its equipment and coliform levels reverted back to regulation levels. No further cases were associated with the dairy for the rest of the year.

A fourth cluster of Campylobacter was discovered in late summer 2012 involving a local dairy in Arizona near the southwestern Utah border. One Utah case and one Arizona case

reported eating unpasteurized cheese curds from the dairy. As the dairy was out of state, Arizona handled the investigation; no other Utah cases reported exposure to that dairy.

2013

In the spring of 2013, there was a cluster of *Campylobacter jejuni* associated with a dairy in Arizona near the Utah border. Four Utah residents developed campylobacteriosis after consuming unpasteurized cheese curds from this dairy. The four cases yielded three different PFGE patterns.

A second cluster of *Campylobacter jejuni* was discovered later in 2013. There were 11 laboratory-confirmed cases and 15 probable cases associated with this outbreak. Eight of the 11 confirmed cases consumed some raw milk product, and seven of those eight reported that it came from the same dairy in Ogden, Utah. The cases' onsets spanned more than a month. One case was hospitalized. The dairy was inspected by UDOH and UDAF, and the dairy owner committed to taking action to make product as safe as possible.

Less than a month later, a small cluster of *Salmonella montevideo* was discovered to be associated with the dairy in Ogden. This was an unusual PFGE pattern for Utah; it had not been seen in 2013 prior to this cluster. There were two laboratory-confirmed cases in young children who drank unpasteurized milk from the dairy.

VIII. All Illnesses Associated with Unpasteurized Milk

From 2003 to 2013, 16.1% of people in Utah with campylobacteriosis for whom data were available (including outbreak-related cases) reported having consumed unpasteurized milk or unpasteurized milk products. Consumption of unpasteurized milk was reported in 1.9% of cases with Shiga toxin-producing *E. coli*; and in 2.4% of those with salmonellosis (see Table 1 on the following page).

Table 1: Percent of cases of campylobacteriosis, Shiga toxin-producing *E. coli* (STEC) infection, and salmonellosis who reported consuming unpasteurized (raw) milk or unpasteurized milk products, State of Utah, 2003-2013.

Year	Campylobacteriosis	STEC	Salmonellosis
2003	10.1	0	1.0
2004	13.9	2.8	1.6
2005	23.7	2.8	3.0
2006	18.4	2.7	1.9
2007	36.6	0	5.8
2008	9.8	3.7	1.6
2009	8.9	1.0	1.5
2010	10.8	1.4	4.8
2011	8.4	0	3.0
2012	8.7	3.0	1.4
2013	12.4	4.3	1.4
2003-2013	14.7	2.0	2.7

Campylobacter: Number and percentage of cases of campylobacteriosis who reported consuming unpasteurized (raw) milk or unpasteurized milk products, State of Utah, 2003-2013.

Year	Raw Milk	Answered*	%
2003	14	139	10.1
2004	23	165	13.9
2005	37	156	23.7
2006	25	136	18.4
2007	59	161	36.6
2008	21	214	9.8
2009	22	248	8.9
2010	38	352	10.8
2011	33	392	8.4
2012	39	446	8.7
2013	53	428	12.4
2003 – 2013	366	2837	14.7

*Answered: Number of cases for whom a response was available (excludes lost to follow-ups).

Shiga toxin-producing *E. coli* (STEC): Number and percentage of cases of STEC illness who reported consuming unpasteurized (raw) milk or unpasteurized milk products, State of Utah, 2003-2013.

Year	Raw Milk	Answered*	%
2003	0	52	0
2004	1	36	2.8
2005	1	36	2.8
2006	3	113	2.7
2007	0	59	0
2008	2	54	3.7
2009	1	99	1.0
2010	1	70	1.4
2011	0	132	0
2012	3	99	3.0
2013	3	70	4.3
2003 – 2013	15	820	2.0

*Answered: Number of cases for whom a response was available (excludes lost to follow-ups).

Salmonella: Number and percentage of cases of salmonellosis who reported consuming unpasteurized (raw) milk or unpasteurized milk products, State of Utah, 2003-2013.

Year	Raw Milk	Answered*	%
2003	1	98	1.0
2004	2	126	1.6
2005	5	164	3.0
2006	3	154	1.9
2007	9	156	5.8
2008	4	247	1.6
2009	4	270	1.5
2010	14	313	4.8
2011	17	293	5.8
2012	3	215	1.4
2013	4	281	1.4
2003 – 2013	66	2317	2.7

*Answered: Number of cases for whom a response was available (excludes lost to follow-ups).