



Montana Environmental Health Association

Campylobacteriosis Outbreak 2010

By Jennifer Lowell, Ph.D., State Epidemiologist

During July 2010, a campylobacteriosis outbreak occurred in the West Yellowstone area of Gallatin County. A multi-agency investigation into the contamination of a public water supply was launched. Partners in the investigation included the Montana Department of Public Health and Human Services (DPHHS) Communicable Disease Epidemiology (CDEpi) Program, DPHHS Food and Consumer Safety Section (FCSS), the Montana Public Health Laboratory (MTPHL), the Madison County Local Health Department (LHD), the (GCCHD), the Madison Valley Hospital (MVH), the Montana Department of Environmental Quality (DEQ), and the Centers for Disease Control and Prevention (CDC).

The etiologic agent of the outbreak was *Campylobacter jejuni*. Case-patient interviews and environmental sampling indicated that contaminated well water from a campground consisting of 14 rental cabins, 17 full RV hook up sites, seven RV/trailer sites with water and electricity, seven tent camp sites, restrooms, showers, laundry facilities, a riverside café, a fly fishing shop, and a private residence (Establishment A) was the primary source of illness. This establishment was supplied by two wells that are later referred to as wells one and two.

On July 21, 2010, the DPHHS CDEpi Program was notified by the Infection Control Professional (ICP) at MVH in Ennis, Montana that beginning around July 1, an increased number of persons were reporting to the clinic and emergency department (ED) with acute gastroenteritis. Approximately 22 cases and six hospitalizations, including one in Rexburg, Idaho were reported by the ICP. Patients were experiencing a 4-5 day illness, uncontrollable diarrhea, nausea, severe abdominal cramping, and dehydration. Eleven stool samples previously submitted to Billings Clinic Laboratory (Billings, MT) for bacterial enteric pathogen testing had not yielded positive results. Concurrently, the Madison County LHD inquired with the CDEpi Program regarding two pending stool sample norovirus tests that were submitted to the MTPHL by MVH two days earlier. A CDEpi Program epidemiologist reported negative norovirus test results to the Madison County LHD and inquired about the rise in acute gastroenteritis cases near Ennis. An enteric-illness outbreak hypothesis generating questionnaire was distributed to the Madison County LHD and the MVH ICP to collect standardized exposure histories from patients. That day, Mayo Clinic Laboratory reported one confirmed and two presumptive *C. jejuni* culture results to MVH. At this time, an outbreak of campylobacteriosis was suspected.

By interviewing patients using a standardized *Campylobacter* exposure questionnaire,

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Special points of interest:

- Detailed Report of *Campylobacteriosis* Outbreak by state epidemiologist!
- Bacon Handling
- MEHA 2010 Awards
- Lake County Advisory Board Update
- Farewell to Tom Barger

From the Editor

Hello all!

A lot has happened since the last edition of our newsletter: the fall conference, a large outbreak in south central Montana and the legislative session has now begun. This particular edition of the MEHA Newsletter is exploring its capabilities in publishing more lengthy and scholarly items than it has in the past, as well as taking a moment to reflect on the organization's history, courtesy of Cam Shipp. This edition has taken a lot of time, but time well spent. I had the privilege of conniving an article out of Jennifer Lowell, the state epidemiologist, that not covers the campylobacteriosis outbreak, but also describes the epi process used in the investigation – valuable and pertinent information in our field. She is a wonderful resource and we are flattered to have had her grace our newsletter with her knowledge. I hope that other members out there who have a longer and more detailed story, or scholastic article to publish will definitely send it our way. We would love to see it. That being said, let's dive into the information and stories we all have to share, treasure a moment in the past, applaud a conference well done and salute a member in our field who will be greatly missed.

Yours truly,



Got article ideas?

Contact

*ajohnson@co.missoula.mt or
rdaniels@ravallicounty.mt.gov.*

MEHA Supports Continued TSEP Funding

By: Christine Hughes

A recent request by the American Council of Engineering Companies of Montana to support maintaining funding to the Treasure State Endowment Program (TSEP) was asked of MEHA. The TSEP program was created in 1992 to fund infrastructure projects such as water, sewer, solid waste and bridges. Governor Schweitzer's proposed budget would transfer \$18.5 million from the TSEP program to the general fund. On December 6, 2010 the MEHA Board voted to support maintaining funding for TSEP. A few of the other organizations endorsing the continued funding are the Montana Association of Counties, Montana League of Cities and Towns and the Montana Contractors Association.

Thank you for being a Silver Sponsor at our Fall Conference!



Campylobacteriosis is an acute gastrointestinal illness caused by bacteria of the Campylobacter species, predominantly Campylobacter jejuni. It is estimated that over 2.4 million persons are affected every year in the U.S., and is the leading cause of acute bacterial gastroenteritis in the industrialized world. Rates of campylobacteriosis are typically higher in the summer months and cases are generally sporadic rather than outbreak

Campylobacter Outbreak

Continued from Cover

public health professionals in Madison County were able to determine that approximately 98% of the cases interviewed reported eating at Establishment A in the West Yellowstone area of Gallatin County. The GCCHD were notified of the outbreak and began active surveillance for campylobacteriosis cases with a history of travel to the West Yellowstone area during June and July, 2010. The two previously presumptive stool cultures were confirmed as *C. jejuni* bringing the total to three confirmed campylobacteriosis cases. All three confirmed patients reported eating at Establishment A. Concurrently, the Madison County LHD began compiling a line-listing of case information, and requested that stool samples from additional cases be sent to the MTPHL for enteric pathogen testing to include *Campylobacter*, *Salmonella*, Shiga toxin-producing *Escherichia coli* (STEC), *Shigella*, and noroviruses. During the weekend of July 24, 25 additional ill persons presented to the MVH and several were hospitalized. At this time, a total of 40–50 cases of acute gastroenteritis had presented to the MVH during July with upwards of 99% interviewed reporting an Establishment A exposure. Because *Campylobacter* outbreaks are often associated with contaminated water, the water from Establishment A was highly suspected as a primary source of infection.

Control Measures

Information gathered through interviews with sick persons indicated that the Establishment A was the source of the outbreak. Because large campylobacteriosis outbreaks are not typically associated with contaminated food, but have historically been linked to contaminated water, the water at the Establishment A was tested. After notification of the epidemiologic evidence surrounding the investigation, the owners of the Establishment A voluntarily closed on July 26. Following positive fecal coliform and *E. coli* testing on July 25 and 27, the café was officially closed, well number one located in the basement of the café was removed from the distribution system, and a boil order was placed on the remaining open facilities at the campground (cabins and RV hookup areas). Following positive *Campylobacter* test results from well one on July 29, a decision was made to close the café until a new water source could be identified. Well two also tested positive for *Campylobacter*. However, this source was chlorinated, remained under a boil order and served as the sole water source following the café closure. Following approximately one week of chlorination, well number two again tested positive for *Campylobacter*, and was also taken off-line for public consumption.

Environmental Investigation

Water Sampling:

On July 25, a GCCHD sanitarian visited Establishment A and collected 100 ml water samples from the taps of the café kitchen and from two cabins. Water samples were submitted to the MTPHL for total coliform and *E. coli* testing. Additional water samples from various cabins and both wells were tested for total coliforms, fecal coliforms, and *E. coli* on July 25, 27 and August 9. Ten liter grab samples were taken from both wells on July 29. Additional grab samples and a 100 liter sample collected using an ultrafiltration protocol (CDC) were taken from well two on August 10 following 10 days of chlorination and a complete well volume purge. Three grab samples were also taken from a seepage pit near the café. All large volume grab samples, filtered samples, and seepage pit samples were submitted to the CDC, National *Campylobacter* and *Helicobacter* Reference Laboratory, Enteric Diseases Laboratory Branch, Atlanta, GA for *Campylobacter* testing and pulsed-field gel electrophoresis (PFGE) analysis on recovered isolates.

Campylobacter Outbreak

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Stool Sample Testing:

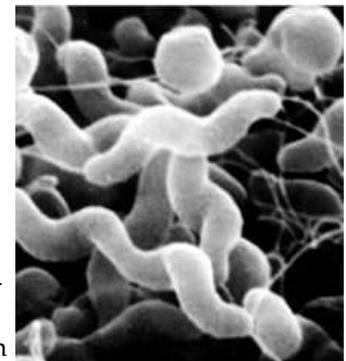
The MTPHL tested eight stool samples for *Campylobacter*, STEC, *Shigella*, *Salmonella* (enteric panel), and norovirus. An additional 20 stool samples were screened for *Campylobacter* only, ten of which were from CFL employees. With the exception of employees, all stool samples were collected from ill persons who reported an Establishment A exposure. *Campylobacter* isolates from outbreak associated samples, and three additional isolates that were known not to be outbreak associated, were submitted to the CDC, National *Campylobacter* and *Helicobacter* Reference Laboratory, Enteric Diseases Laboratory Branch, Atlanta, GA for PFGE analysis.

Laboratory Testing Results – Water Samples:

Water samples taken from the Establishment A café on July 25 were positive for total coliforms and *E. coli* indicating that well water supplied to the café was likely contaminated with fecal matter. All samples from July 27 were positive for the presence of total coliforms indicating environmental contamination while only two cabins and the café tap water were positive for the presence of *E. coli*. Fecal coliform and *E. coli* counts from well one samples (café) on July 27, were 6.0 cfu/100 ml and 21.3 cfu/100 ml respectively indicating further that the water from well one was contaminated with fecal matter. The August 2 samples were taken during chlorination of well two and were therefore negative for the presence of total coliforms and *E. coli*. On August 9, after chlorination was removed, well two samples were positive for total coliforms. All water samples and seepage pit samples were positive for *C. jejuni*.

Laboratory Testing Results – Stool Samples:

C. jejuni was the only pathogen detected (isolated) from the eight stool samples that were tested against the full enteric panel and norovirus. Of the 20 samples screened for *Campylobacter* only, 11 were positive. Of these, four were employee samples. Sixteen sample isolates had matching PFGE patterns and three isolates that were originally thought to be outbreak associated did not match. The three isolates that were known not to be outbreak associated also did not match by PFGE. The 16 matching human isolates also matched the PFGE pattern from the water and seepage pit samples.



Campylobacter jejuni

Epidemiologic Investigation:

Active case finding was performed by contacting states neighboring the West Yellowstone area (Idaho and Wyoming), by sending out statewide notifications via the Montana Health Alert Network (HAN) system, and by sending out a nationwide notification via the CDC Epi-X Epidemic Information Exchange system. By mid-August, cases had been reported from 6 states including CA, ID, MN, MT, UT, and WA. A total of 97 cases reported to a clinic or an ED, or called a public health department to report illness. Of those, 41 were laboratory confirmed. Onset dates were reported for 66 cases (68%). No onset dates were reported for employees with positive *Campylobacter* tests. Of the 97 total cases, 72 (74%) reported age or date of birth while 80 (89%) reported sex. Forty-seven (59%) were male.

Campylobacteriosis is also the leading cause of acute bacterial gastroenteritis in Montana and cases are generally sporadic. In 2009, 164 cases (16.8/100,000) of campylobacteriosis were reported statewide. The 2009 rates in Montana ranged from 2.0–3.1 cases per month/100,000 during May–August, compared to 0.4–1.3 cases per month/100,000 for the remaining months.

Campylobacter Outbreak

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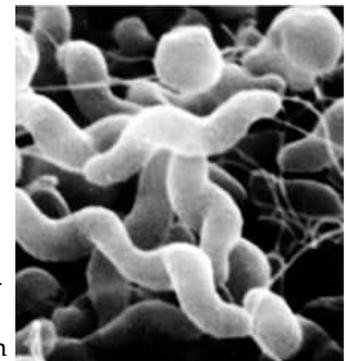
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C. jejuni forms part of the normal gut microflora of a variety of wild and domestic animals including cattle, sheep, birds, and household pets. While it is considered to be sensitive to environmental stress like heating and drying, its survival and transmission by the fecal-oral route is effective. Occasionally campylobacteriosis outbreaks can occur and are most often associated with raw-milk consumption or contaminated water. In July 2010, Montana public and environmental health professionals experienced a large campylobacteriosis outbreak firsthand.

Campylobacteriosis Outbreak Outcome

In early August 2010, the Establishment A owner hired an engineer to design plans and specifications for a new well. The contract engineer and Montana DEQ staff worked to map the groundwater flow direction and located a new well site ensuring that all existing and proposed sewage components including drain field mixing zones were outside the well continued protection zone. The DEQ issued approval to construct the new well on August 24, 2010 and on August 28, 2010 Madison Drilling and Pump Supply drilled the new well to a depth of 120 feet with a static water level of 28 feet below ground surface (BGS). Additionally, the system design allowed space for installation of a full-time chlorination system. After drilling completion, the distribution system was connected to the new well, flushed, and disinfected. On October 6 water samples were taken from the well head and from the café (distribution system) for total and fecal coliform, nitrate, and *Campylobacter* testing as described above. Total coliform, fecal coliform, and *Campylobacter* test results were negative, and nitrates levels measured 0.13 mg/l. The cutoff value for nitrates levels is 10 mg/l. On October 26 the U.S. Forest Service completed and executed a 9 month temporary permit for Establishment A operation through the end of June, 2011. Upon meeting conditions set forth in the temporary permit (e.g. moving forward with planning for a new septic system and some other miscellaneous maintenance items) by June 2011, a long term, 20 year permit will be issued. Based on the actions above and a preopening inspection of the Establishment A café, the GCCHD rescinded the Health Officer orders closing the campground and restaurant on October 28. The boil water order issued to Establishment A on July 29 was closed on October 29, 2010.

Although no primary source of well contamination was determined for this outbreak, theories include fecal contamination from various seepage pits (sewage handling pits) located around the Establishment property, or surface water contamination from high water and flooding the previous spring, followed by *Campylobacter* biofilm formation within wells and the distribution system. Whatever the original source of contamination, this outbreak investigation exemplifies the need for multidisciplinary teams and open communication amongst public health, environmental health, and laboratory professionals to achieve the best possible public health outcomes when confronted with a complex scenario such as the one outlined above. The expertise of all involved was vital in successfully controlling illness associated with this outbreak and preventing illness associated with Establishment A from occurring in the future.

Bacon: Fresh is Best!

By: Shawn Moore

Bacon is made from the pork primal known as the side or belly. After removal of the spareribs, it is trimmed and cured with a brine solution. The brine cure containing salt, sugar and other flavorings gives bacon its unique flavors. Bacon is also cured with sodium nitrite, a necessary ingredient that provides the cured meat flavor, a pink color to the lean meat, and allows longer storage times than fresh meat. All bacon is flavored with smoke from hardwood trees, usually hickory or maple. It is NOT a fully cooked product (unless labeled as such), and it must be cooked prior to serving. Fresh bacon is a potentially hazardous food and must be stored at 41 degrees or lower. The following recommendations apply to purchasing and storing fresh bacon. Bulk bacon (not vacuum packaged) should have a fresh, smoky aroma with a pink or

Bacon: Fresh is Best!

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red color to the lean meat portions. The outside edges of a fresh bacon slice should have a golden-brown color from the smoking process. It should not be slimy, excessively dry, or have sour off-odors. Old bacon will have a more grayish-brown color to the meat and it may smell rancid. Old bacon may have a slightly yellow color in the fat of the sliced surfaces, while fresh bacon will have creamy white-colored fat. Purchase only the amount of bulk bacon that can be used within one or two weeks.

Vacuum packaged bacon, like you purchase in the grocery store, should be consumed before the “use by” date or within one week after the “sell by” date on the package. Freshness dating is not required by law, but most manufacturers place these dates on the packages for quality assurance. The shelf life of bacon is most influenced by the sanitation conditions at the processing plant and storage conditions while in commerce. You can inspect the product through the package window to determine its lean-to-fat ratio and wholesomeness. Look for a tight vacuum seal (spoilage bacteria in the package will form gasses and make the packaging appear loose or bloated.) Also look at the juices in the package – they should be clear and not have a “milky” appearance. After opening the package, use your nose to detect rancid or sour off-odors. The bacon should not be slimy. While cooking, rancid bacon will produce undesirable odors. There is a high degree of variability in a person’s ability to detect rancid flavors and odors – some people are very sensitive to these flavors and odors while others do not find them offensive.

Frozen storage of bacon is not recommended because its fatty acids continue to oxidize. Sliced bacon has a high percentage of exposed product surface area. Oxygen, light, and the salts used in curing accelerate the development of oxidative rancidity in sliced meats. Limited frozen storage may provide some convenience if the entire package cannot be used within a week. It may be divided into smaller serving sizes and placed into zipper-top storage bags. If you choose to freeze bacon, package it tightly, date the packages, and USE IT UP WITHIN ONE MONTH. It will never taste as good as it did when fresh, but freezing will prevent bacterial spoilage.

The shelf life of bacon is most influenced by the sanitation conditions at the processing plant and storage conditions while in commerce.

Got MEHA???



Dress your best and support MEHA at the same time!

T-shirts and Hats with the MEHA logo are on sale for \$10 each.

Contact Christine Hughes at chughes@lakemt.gov, or Crystal Nuno at crystal.nun@riverstonehealth.org for details.

Lake County Food Safety Advisory Group – One Year Later

Christine Hughes, R.S.

As part of the FDA Voluntary National Retail Food Regulatory Program Standards, Lake County created a Food Safety Advisory Group in November 2009. The intent of the group is to open lines of communication within the community regarding food safety, foster and recognize community initiatives focused on the reduction of food-borne disease risk factors.

In order to form the group, Lake County Environmental Health sent an invitation to all licensed food establishments, extension offices, food suppliers, Lake County Board of Health and PTA associations as well as advertising locally.

The group has been meeting bi-monthly for one year. The group regularly invites guest speakers to talk on food safety issues. As a group we have discussed items such as preferred food safety training materials, the Montana Food Star Program, posting on-line food inspections and food inspection grading systems.

Our recent focus has been on starting the Montana Food Star Program in Lake County. In order to offer the Montana Food Star Program, Lake County felt it necessary to be able to offer an 8 hour ServSafe course. This prompted Lake County, MSU Extension office and the Salish and Kootenai Tribal Extension office to work together in getting instructors certified to teach the 8 hour course and share the duty of teaching the course.

A few of our future topics of discussion will include farmer's markets, temporary food events, food security, and what to do when emergencies such as boil orders take place in a food establishment. So far, this has been a great way to open lines of communication and get the public more actively involved in food safety. We look forward to seeing the continued growth of the group.

Farewell and Happy Retirement

As many of you may have heard, Missoula City-County Health Department suffered a tremendous loss in December with the retirement of their beloved Environmental Health expert Tom Barger.

Tom worked in public health for almost 37 years covering many aspects of Environmental Health including restaurant inspections, subdivisions, public water supplies, and has been proclaimed by many as Missoula's wastewater and disposal expert. He also helped develop the Missoula Water Quality District; the sole source aquifer project being the aspect of his career of which he was most proud.

His career was diverse; his contributions to the field many, and the impact he has had on those in Missoula and Montana environmental health as a whole, immeasurable. We miss him immensely, and treasure having had the chance to work with and learn from him.

We wish him well and lots of love!



Fall Conference Wrap-up

Montana and Wyoming had their first joint conference, Conference on the Caldera, at Mammoth Hot Springs last fall. The Conference was a huge success, educational and a ton of fun! The conference had a great turnout, entertaining divergent environmental health tracts, one geared toward wastewater and another toward general environmental health and licensed establishments. It even included a tour of West Yellowstone's composting facility and wastewater treatment plant.

Thanks to Crystal and the gang for putting in all of the time and energy to make a huge undertaking a great success!



2010 MEHA Awards

Donald E. Pizzini Outstanding Achievement Award:

Kathy Moore, R.S. – Lewis and Clark City-County Health

William G. Walter Outstanding Sanitarian Award:

Crystal Nuno, R.S. – Riverstone Health

Vernon E. Sloulin, R.S., Rookie of the Year Award:

Alisha Johnson, R.S. – Missoula City-County Health

Excellence Award:

Laurel Riek, R.S. – Lewis and Clark City County Health

Distinguished Service Award:

Dr. Tony Ward and Dr. Curtis Noonan

Certificates of Recognition:

Denise Moldroski, R.S. – Gallatin City-County Health

Sheryl Consort, MDEQ

Jeanna McPherson, R.S. – Missoula City-County Health

Save the date!

Spring FCS Training/MEHA Conference

April 12-14th at the Great Falls Holiday Inn.

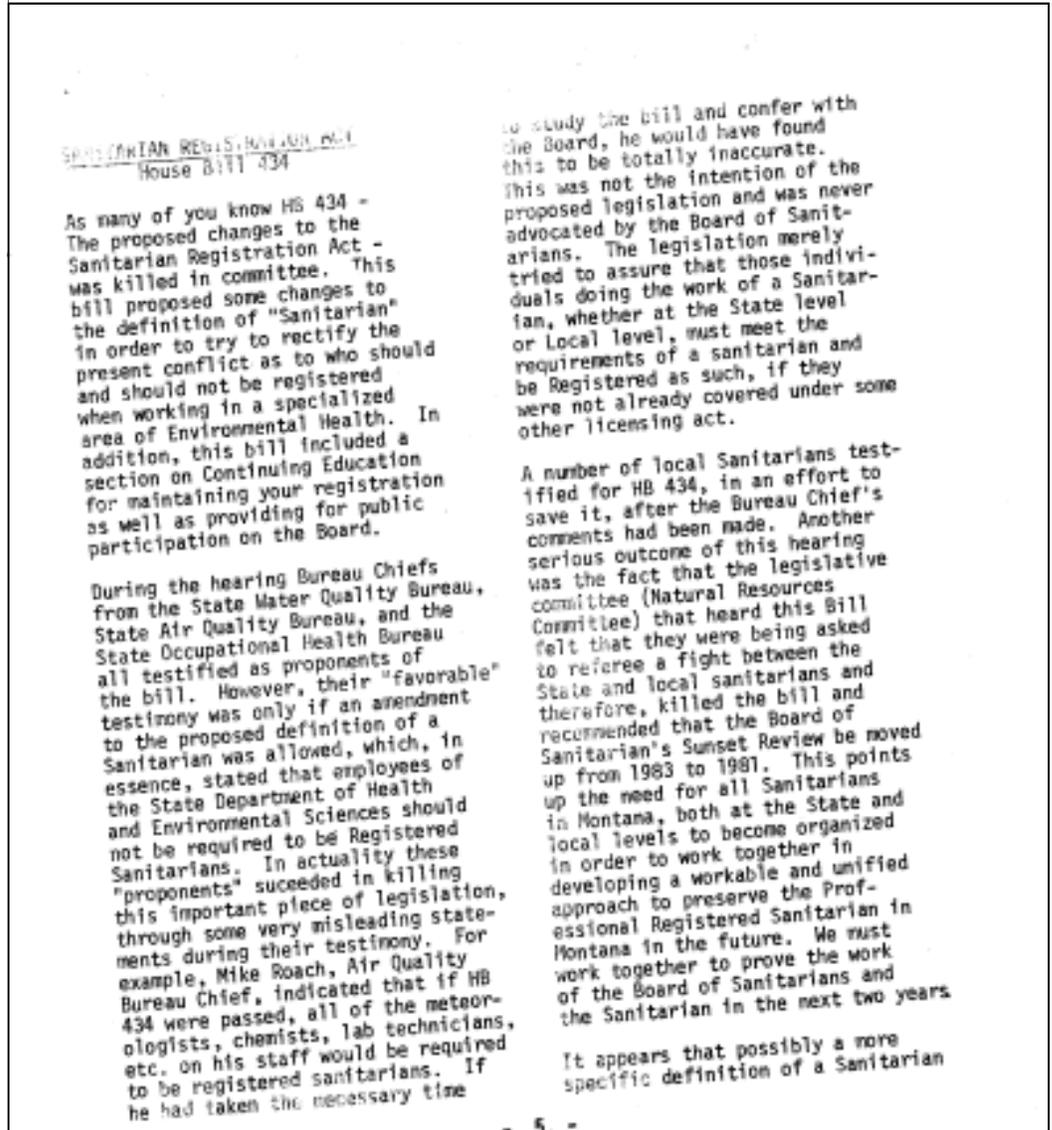
Topics include: HACCP, Sprout Growing, Smoking, Curing, Custom Processing, Additives, Juices and Reduced Oxygen Packaging.

All meals are per diem. Lodging is \$77/ night.

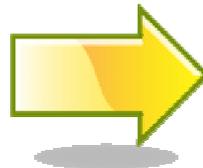
Contact Food and Consumer Safety for registration and details.

A Little Taste of History... from the MEHA Newsletter of 1973

Since it's time for the legislature, it felt perfect to remind everyone that battling bills which make our profession challenging, is nothing new!



However... while the politics remain the same... at least the salaries have increased... well... somewhat!



Applicants are being accepted for a position as a Inspector I, for Nursing Homes & Hospitals (Grade 13), (Sanitarian) --- For assignment to the Hospital and Medical Facilities Division in Helena. Requires a bachelor's degree in physical or biological sciences and two years public health sanitarians experience or any equivalent combination of education and experience per class code.

Salary \$13,946 to \$17,867