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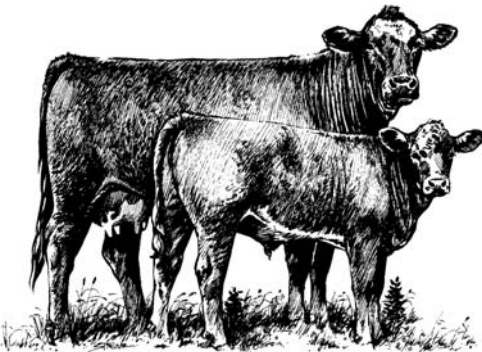
Food Facts For You!

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Frequently Asked Questions about Mad Cow Disease; Pasture-Raised Animal Products – Should They be Promoted?; Looking Ahead: September 2005 is National Food Safety Education Month; Thermometer Use Campaign Evaluation Materials; What's On Your Mind: preserving garlic & peppers; canning on glass-top stoves.

Frequently Asked Questions About Mad Cow Disease

Another case of 'Mad Cow Disease', or BSE, surfaced in the United States in June 2005. The following is information on this disease and implications for U.S. consumers.



What is BSE, and what causes the disease in cattle? BSE or bovine spongiform encephalopathy is type of transmissible spongiform encephalopathy (TSE), a brain wasting disease of adult cattle. It is generally believed that the disease is caused by prions, mis-shapen proteins found in tissue such as the brain and spinal cord of diseased animals.

We don't know for sure how this disease got its start, but it may have resulted from the feeding of scrapie-containing sheep meat-and-bone meal to cattle. Scrapie is a prion disease in sheep that has been around since the 1700s. It appears that changes in the animal rendering process in the 1970s and 1980s allowed prions from infected animal parts to survive the rendering process. Some of this infected material was fed to cattle as meat-and-bone meal. Eventually, the outbreak in cattle was amplified by feeding infected bovine meat-and-bone meal to young calves.

When was BSE first discovered? This disease was first noted in cattle in 1986 in the United Kingdom. By 1993 the disease was making headlines when almost 1,000 cases of this disease were noted each week in cattle in the U.K. In addition to the U.K., the disease has been found in cattle in at least 22 countries including Canada, France, Germany, Japan, Spain, Switzerland and more recently in the U.S.

Wasn't the case of BSE that was announced in June the second case of BSE in the U.S.? Yes, on December 23, 2003, the U.S. Department of Agriculture announced a presumptive diagnosis of BSE in an adult Holstein cow from Washington State. Those samples were confirmed positive for BSE by a laboratory in England. Trace-back based on an ear-tag identification number suggests that the BSE-infected cow was imported

into the United States from Canada in August 2001. So the most recent case of BSE was the first time a native-born animal was diagnosed with BSE.

Does BSE infect people? BSE is linked to a form of a human disease known as Creutzfeldt-Jakob disease, or CJD. CJD is a transmissible spongiform encephalopathy (TSE) in humans. This disease is currently undiagnosable, except on autopsy, it is not treatable, and is always fatal. A certain number of individuals will succumb to human TSEs such as CJD as a result of heredity or genetic variation; about one in one million individuals.

In the late 1980s as the outbreak of BSE was occurring in the United Kingdom, a new form of CJD was identified. This new form of CJD occurred in younger individuals, the disease was more prolonged and the brain tissue, on autopsy, looked slightly different from standard CJD. This new form of the disease is now known as new variant CJD (nvCJD or vCJD). There is evidence that nvCJD, not standard CJD, is linked to the consumption of BSE-contaminated meat.

Is BSE a foodborne hazard in the United States? We know that BSE itself is not contagious among animals, nor is it contagious to humans. Cattle become infected on ingestion of meat-and-bone meal derived from BSE-infected cattle. Humans apparently become infected from ingesting a certain quantity of infected animal material. There may also be a certain genetic pre-disposition to the disease.

We can look to the experience in other countries to try and determine if BSE is a foodborne hazard. In the United Kingdom, over 1 million animals have been diagnosed with BSE, and roughly 150 humans have succumbed to nvCJD, leading scientists to conclude that a substantial species barrier appears to exist in transmission of the illness from cattle to humans. The one reported case of nvCJD in the United States was in a young woman who contracted the disease while residing in the UK and developed symptoms after moving to the U.S. The risk to human health from BSE in the United States is still considered very, very low.

Exactly how does meat become contaminated with BSE? Some animal tissue can accumulate the prion protein and these tissues should be avoided: the brain, spinal tissue, eyes, tonsils, nerve tissue and the distal ileum of the small intestine. Beef muscle is not considered a problem unless it becomes contaminated during processing, i.e. when an animal is stunned for slaughter, when a saw is used to cut through the spinal column as a carcass is fabricated into smaller pieces, or when meat is mechanically separated from bone. Ground beef, since it can be prepared from carcass trimmings and/or from mechanically separated meat is the form of muscle tissue that has been of greatest concern.

What steps have been taken to protect the health of U.S citizens? In 1989, the USDA first instituted measures to safeguard the U.S. food supply, and those safeguards have been updated in light of recent outbreaks. Some of these safeguards include:

- Ruminant animal parts can not be fed to other ruminants (ruminant to ruminant feeding ban)
- Cattle materials that carry the highest risk of BSE (brain and spinal tissue, small intestines and tonsils) can not be used in human food, including dietary supplements and in cosmetics
- Meat from non-ambulatory, disabled cattle can not be used for human food

- Material from mechanically separated beef can not be used for human food and in cosmetics

Of the two cases of BSE diagnosed in the U.S., no meat or animal remnants entered the human food chain.

What are the implications of an animal in the U.S. testing positive for BSE?

Perhaps the greatest impact of this finding will be on the U.S. export market. The U.S., like many other countries, has adhered to a policy to import beef only from BSE-free countries. So when the first case of BSE was noted in an animal in the U.S. in December of 2003, many countries shut their borders to U.S. beef. Before the crisis, the U.S. beef export market amounted to roughly \$3 billion per year. Countries which import U.S. beef have been slow to re-open their markets to U.S. beef, and with another positive test result, the re-opening of exports market will likely slow even further.

Interestingly, the U.S. is a major importer of beef from Canada. Canada noted their first case of BSE in June 2003, and the U.S. waited until July 2005 to re-open the border to Canadian beef imports. Large beef processors in the Midwestern states had, for some time, been urging the U.S. government to reinstate the importation of Canadian beef. Lack of beef animals has led to plant closures and layoffs due to an insufficient beef supply. Australia has stepped up its beef exports to meet the demand of countries that no longer accept U.S. beef.

What does this positive test result say about testing U.S. cattle for BSE? Roughly 338,000 samples have been tested in the past year to monitor the presence of BSE in the U.S. cattle population, with one in every 90 cattle being tested. When the first case of BSE was detected in 2003, the U.S. was testing one in 1,700 animals. Critics argue that Japan's model of testing every cow or Europe's model of testing of one in every four animals, is more appropriate for this country where the beef export market is so important. However, testing more animals would be more expensive for processors and the increased testing is likely to uncover more positive samples which may unnecessarily heighten concern over the safety of U.S. beef.

What, if any, reassurance is there for consumers? Experts have concluded that BSE poses a very small risk to consumers. Consumer confidence in U.S. beef remains high and the government is taking steps to ensure that appropriate regulations are in place to continue to protect the food supply.

REFERENCES:

**Bovine Spongiform Encephalopathy* (U.S. Food and Drug Administration)
<http://www.fda.gov/oc/opacom/hottopics/bse.html>

**Transmissible Spongiform Encephalopathy: A Scientific Status Summary* by Will Hueston and Cory Bryant. 2005. *Journal of Food Science* July/August R77-R87.

Understanding BSE and Related Diseases by Will Hueston and Cory Bryant. 2005. *Food Technology* p. 46-51.

*Posted online at www.wisc.edu/foodsafety and later archived with newsletter back issues under BSE http://www.wisc.edu/foodsafety/ffBackIssues_subject.htm

Pasture-Raised Animal Products – Should They be Promoted?

(Note: the following was reprinted with permission from the Society for Nutrition Education, Sustainable Food Systems Special Interest Division June 2005 newsletter: <http://www.sne.org/>)

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As interest in pasture-raised animal products is growing, benefits for consumers, farmers, communities and the environment become more evident.

The term "pasture-raised" encompasses several animal production systems. You may be more familiar with terms used for specific species such as "free-range" poultry, and "grass-based or-fed" beef and dairy products. These terms distinguish pasture-based systems from conventional or "industrial" practices such as "caged" or "confined" poultry operations, or "grain-fed" for beef and dairy.¹

Pasture-based production for poultry varies in the levels of forage in the birds' diets. In a "pastured system" the birds live in moveable pens, moved daily to allow access to fresh pasture, exercise and fresh air. Forage can constitute from 20-25% of the diet with the rest coming from non-medicated or natural feed. "Free-range" poultry may be raised in a confinement facility, but can range freely outside in an enclosed ranging area.

For beef to qualify as pasture-raised, animals stay on pasture for their entire growth to market weight. More typical beef production places weaned calves, at four to six months (or 400 to 650 pounds), in a feedlot where they achieve market weight of 1100 to 1300 pounds with a grain diet. The terms "grass-fed", "grass-based", or "grass-finished" is used for beef animals that complete their growth on pasture as opposed to feed-grain. When applied to dairy cows, the terms "grass-based/fed", means that the herd gets most of their feed from pasture during the growing season. The amount of supplemental, stored feed varies from 5 to 20 pounds per cow. Of course, since most dairies produce milk throughout the year and pastures are not available in winter, dairies use stored feed - silage, hay and grains- during these months.

For lamb that is pasture-raised farmers will schedule lambing to coincide with the growth of the pasture so that ewes receive the nutrition they need from the pasture for gestation and lactation. After weaning, the lambs will remain on pasture until they reach market weight. Few commercial pigs derive a majority of their feed from pasture but alternative pork production systems allow some access to pasture for breeding, gestating, and growing animals.

Sorting out the Truth from Health Claims about Pasture-Raised Animal Products

Probably of greatest interest to nutrition educators and practitioners are claims of health benefits associated with eating pasture-raised animal products, and consumer interest in these products.

The central health claim is that pasture-raised animal products are lower in fat (and hence in total calories), and higher in beneficial fats, particularly omega-3 (n3) fatty acids, conjugated linoleic acid (CLA), and vitamins, particularly vitamin E. These claims have truth to them based on scientific study, but they also need to be put into perspective of the entire consumer diet.

Grass-fed beef and bison, for example, have been shown to be 20-50% lower in total fat and contain 15-50% fewer calories per serving than their feedlot counterparts.² At less than 1.5 grams of total fat per 100g serving, these grass-fed meats come close to the fat content of commercial chicken without the skin (0.8g per 100g serving).

There is also good analytic support for claims that grass-fed beef has five times the amount of vitamin E, 1.5 to 3 times the amount of CLA, and has a better mix of fatty acids (more n-3; lower n-6:n-3 ratio) than conventional beef.³ But because these are multiples of very small numbers, the absolute amounts do not support a strong nutritional argument for grass-fed beef. For example, walnuts, at 24 mg vitamin E per 100g, contain 34 times as much as the same amount of grass-fed beef. While the proportion of total fat that is CLA might be double in the grass-fed animal, the absolute amount is probably lower because there is less total fat. On a per-100g fat basis, grass-fed beef contains 6 mg versus 8 mg CLA in feedlot beef.⁴ Further, feed grain can be supplemented with n-6 rich oils to increase CLA content in grain-fed beef. The evidence of health benefits for humans from ingesting food enriched in CLA (as opposed to mice fed synthetic CLA supplements) is as yet inconclusive. So, the CLA claim also is not one to perpetuate as a reason to promote the consumption of grass-fed beef.

Finally, the n6:n3 fatty acid ratio claim. The Dietary Reference Index recommends a 10:1 ratio, while levels recommended for heart disease prevention, and optimal brain development and pregnancy outcomes is closer to 2:1. In comparison studies, grass-fed beef had a lower ratio of n6:n3 fatty acid, at about the ideal of 2:1. The ratio in conventionally produced beef, which ranged between 4 and 6 to 1, while relatively higher than the grass-fed was still lower than the DRI. Also, the level of omega-3 fatty acids declines rapidly and dramatically once cows are taken off pasture and put in a feedlot where they are fed grain. While on pasture n-3 accounts for about 3% of total fat, but by day 112 the level drops to 0.5% and to essentially zero by day 196.⁵ So, in relative terms there is substantially more n-3 in pasture-raised beef and a far better n-6:n-3 ratio. But, the absolute amounts are small. The total fat is lower so this is not a substantial source of n-3 fatty acids.

In general, pasture-based production systems have been shown to increase CLA and n-3 fatty acids, and decrease the n-6:n-3 ratio in dairy products and eggs as well.

Consumer Interest Shows Support for Other Benefits

While nutritionists need to temper promotion of pasture-raised animal products on the basis of nutritional superiority with a dose of realism, there are several other benefits that are worthy of strong support from our profession. And consumers are interested.

There are clear environmental benefits from dispersing and rotating animals on pasture, letting them harvest the grass and convert their food into meat, eggs and milk. The resource costs are lower since the inputs needed to cultivate, grow, harvest and transport feed grains to where animals are confined are much lower. Further, the animal waste from a confinement situation constitutes a pollutant that requires serious management. In a pasture-based system, waste is a valued fertilizer distributed without a single spreader.

There is increasing evidence that such systems lead to a much higher quality of life for farmers and, because these markets tend to be more local, communities also benefit.

American consumers are showing more interest in supporting environmental, health and social values through food purchases. "Cultural Creatives" is the name given to this group by anthropologist Paul Ray. In a survey that was conducted by the Food Alliance, there was overwhelming interest (52%) in supporting sustainable farming. This group, identified as LOHAS (lifestyle of health and sustainability), is considered the fastest growing segment of consumers -- about 4% of the population in the 60's but grew to about 24% by 1995.

These consumers focus on values and relationships and are interested in stories, such as of the farmer and how the animals are raised. They are very interested in the authenticity and the meaning of a product. This group, perhaps real "foodies," would probably want to visit a farm, see how products are made and would be willing to pay for taste.

There is growing awareness of pasture-raised animal products and the multiple benefits that these products may yield. On an internet survey designed to assess the level of awareness of the perceived benefits related to pasture-raised beef, over half of the respondents interpreted the term to mean either "raised and grazed on open pasture" or "grass-fed".⁶

In the same survey more respondents were aware than unaware of the perceived benefit of more humane treatment of cows, protecting water quality and a reduced need for antibiotics.

Results of a survey of 550 consumers in urban and suburban grocery stores in the St. Paul (Minnesota) metropolitan area, showed that after freshness, safety, and health, "practices that protect water quality" (89%), "protecting soil quality" (87%), and "maintain/improve natural resources" (85%), were important reasons for choosing "sustainably-produced" products.⁷

So, what can nutrition educators say to consumers interested in pasture-raised animal products? There are nutritional benefits particularly in their lower fat content. While analyses have associated higher values of CLA, vitamin E, n-3 fatty acid content, and improved n-6:n-3 ratios with pasture-based production systems, these differences in absolute terms are small. There are substantial environmental, animal welfare, quality of life and community benefits to be derived from expanding these systems.

References

1. Smith, M. Holmes, M.S., and Ennis, J. Literature review of consumer research, publications, and marketing communications related to pasture-raised animal products and production systems.
2. Rule, Broughton, *et al.* (2002) Comparison of muscle fatty acid profiles and cholesterol concentrations of bison, beef cattle, elk, and chicken. *J Animal Science*. 80:1202-1211.
3. Auld, Garry. 2004. Is Better Nutrition a Justification for Choosing Pasture Raised Animals? Paper presented at the Animals in the Food System Conference. Sponsored by the C.S. Mott Group for Sustainable Food Systems at Michigan State University, with support from the W.K. Kellogg Foundation. November 3 - 4, 2004.
4. French, Stanton *et al.* (2000) Fatty acid composition, including conjugated linoleic acid, of intramuscular fat from steers offered grazed grass, grass silage, or concentrate-based diets. *J Animal Science*. 78:2849-2855.
5. Duckett & Wagner (1993). Effects of time on feed on beef nutrient composition. *J Anim Sci* 71:2079-88.

6. Pirog, R. 2004. Consumer perceptions of pasture-raised beef and dairy products: An internet consumer survey. The Leopold Center, Business Analysis Laboratory. Iowa State University. Feb. 2004.
7. Robinson and Smith. 2001. Am J Alt Agric. 17(2): 96-104.

Looking Ahead: September 2005 is National Food Safety Education Month

September will be here before we know it, and with it the chance to promote food safety with National Food Safety Education Month (NFSEM) <http://www.nraef.org/nfsem/default.asp>
The theme for September 2005 is *Keep Hands Clean with Good Hygiene*.

In addition to the web site for NFSEM, other online sites which may be useful in promoting food safety include:

- Fight BAC! www.fightbac.org (CLEAN)
- Fight BAC! puppet page <http://www.foodsafety.gov/~acrobat/f00puppt.pdf>
- Keep it Clean – song and coloring sheet <http://www.foodsafety.gov/~fsg/f02color.html>
- The Scrub Club - online action for kids <http://www.scrubclub.org/home.php> (really cool!)
- Soapy Solutions (hand washing activity) <http://www.foodsafety.gov/~fsg/f02exp1.html>
- Hand Washing videos available from the UWEX Coop Media Collection
 - Hands Down on Germs #18217 (for children pre-K thru Grade 3)
 - War on Germs #18223 (for youth & adults)
- Food Safety Puzzle (for children) <http://www.foodsafety.gov/~acrobat/f02clnpz.pdf>
- Home Food Safety Survey <http://www.foodsafety.gov/~fsg/fs01surv.html> (includes all 4 areas to the Fight BAC! campaign)

Thermometer Use Campaign: Evaluation Materials

I am delighted that so many of you have requested the *University of Wisconsin Extension* dial-stem thermometers to use in your programming! In order to gauge the effectiveness of our efforts in teaching participants about using a thermometer to cook foods to safe temperatures, I have developed an evaluation tool for FY06. Please use this tool (pre, post-test) when you offer a lesson on cooking foods to safe temperatures and distribute the thermometers. Evaluation materials are available online http://www.wisc.edu/foodsafety/Food%20Preservation/is_it_done_yet.htm
Please remember to distribute the **Thermometer Use Instructions** (English/Spanish) when you offer the dial-stem thermometers to your learners.



What's On Your Mind?

Where do I find information on preserving garlic or peppers? Lucia Patritto (Iron County) reminded me that it's a good time of year to share the following resources from the University of California – Davis. Thanks, Lucia!

- **Cantaloupe: Safe Methods to Store, Preserve and Enjoy**
<http://anrcatalog.ucdavis.edu/pdf/8095.pdf>
- **Garlic: Safe Methods to Store, Preserve and Enjoy**
<http://anrcatalog.ucdavis.edu/pdf/7231.pdf>
- **Peppers: Safe Methods to Store, Preserve and Enjoy**
<http://anrcatalog.ucdavis.edu/pdf/8004.pdf>

Can a person use a glass- or ceramic-top stove for home canning? Peggy Nordgren (Taylor County) asked this question. I was not sure of the 'official' policy so I queried Dr. Elizabeth Andress, Director of the National Center for Home Food Preservation, as to her thoughts. Dr. Andress's response:

This is still an issue to be dealt with manufacturer by manufacturer. Some say do NOT can on them, others say it's okay but put stipulations on the diameter of the canner compared to the diameter of the burner. One of the concerns is the amount of high heat reflected back down for such a long period of time. And this might be related to discoloration as well as burner damage. Another issue is whether some burners now have an automatic cutoff that will shut the burner off after so much high heat (I just heard this week, but haven't explored to see what brands this might be). Yet another is whether the canner has a flat enough bottom to work well.

I do know that Mirro actually prints a recommendation that says do not use their pressure canners on glass, flat top or ceramic ranges due to the potential to damage the top when the canner is bigger than the burner area. They have it on their 12 qt as well as larger canner. You can see it here at pressure-cooker outlet.com: <http://www.pressurecooker-outlet.com/mirro12qt.htm>

I've been telling people we can't recommend it across the board when some range and canner manufacturers do not recommend it; that the consumer needs to know what their manufacturer says and then deal with the canner bottom/flatness issue. I don't want to be liable for a recommendation that could damage someone's range top if it doesn't follow the manufacturer's advice.

As to the issue of removing a canner from the burner...Canners **may** be removed from the burner after canning.

- If Boiling Water Canning, you take jars out at end of process and can remove the canner right away.
- If Pressure Canning, you can move the canner aside **if** you can do so without tipping over jars (someone's strong enough). A Pressure Canner shouldn't be rushed, or put in a strong cool air draft to speed cooling.

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