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BSE (Mad cow disease) from gelatin? ^[1]

Dear Alice,

I would like to know if I should be concerned with the risk of contracting "bovine spongiform encephalopathy (BSE)" or its human variant, from the use of vitamins, supplements, over-the-counter medication, or pills prescribed by a doctor which contain gelatin?

I understand that one of the main components of gelatin comes from the bones and skin of cows and that it is often imported from other countries. I also understand that it is highly unlikely that the standard processes involved in producing gelatin would ever remove or disable the BSE contamination.

It is also very alarming that BSE has a long incubation period (years) whereby the infected person has no symptoms. However, when symptoms do occur, the person dies a horrible death, via a deformed and shrinking brain, usually soon thereafter.

Since gelatin is used in so many food products, is it realistic to try avoiding all gelatin?

What are the mathematical chances of contracting the disease from gelatin in a food product?

Is there fewer gelatins in a standard hard pill as opposed to a "soft gel" capsule?

I feel the FDA, U.S. Government, and more importantly, the food and supplement industries, should do more to insure that all food products and supplements used in America are free from contamination of this horrible disease in order to prevent any chance of an outbreak like the one seen in Europe a few years ago.

I would appreciate your thoughts on this subject.

Thank you,
John

Answer

Dear John,

Before getting to the specific matter at hand (the safety of gelatin and gelatin-containing products), it's worth mentioning that Bovine Spongiform Encephalopathy (BSE) is rare in the US and there's no evidence that BSE is transmitted through gelatin (be it food, pills, or other products containing gelatin). As of 2017, there have been five cases of BSE in the US. It may also help to review some basic information about BSE and Creutzfeldt-Jacob Disease, a variant form of which may be contracted from BSE-contaminated cattle (more on this in a bit).

Often called "mad cow disease," BSE is a degenerative disease affecting the central nervous system (brain and spine) of cattle. Scientists haven't yet determined the exact cause of the disease, which was first recognized in the United Kingdom (UK) in 1986. While research on the cause continues, it's been recognized that BSE spreads among animal populations when livestock is fed meat and bone material from already infected animals. The BSE crises in the UK through the 1980s and 1990s were thought to have started when sheep infected with scrapie (a sheep disease not transmittable to humans) were fed to cattle. The practice of feeding animal parts to other livestock is now completely banned in the European Union and UK, and partially banned in the US and Canada.

So, how does "mad cow disease" spread to humans? Creutzfeldt-Jacob Disease (CJD) is a rare disorder that causes deterioration of mental function and movement in human beings. A variant form of CJD (abbreviated vCJD), first identified in 1996, is thought to be contracted through eating products from BSE-contaminated cattle, or more specifically, meat that came in contact with infected tissue (including the brain, spinal cord fluid, tonsils, or intestines) during slaughter. Because this is the most likely route of infection, governments have initiated prevention methods to detect and destroy BSE-carrying cattle, disallowed cattle that can no longer walk in the food supply, and prevent the organs from cattle of over 30 months of age from entering the food supply, since younger cattle aren't known to exhibit symptoms of BSE. The US increased the number of cattle tested for BSE annually to half a million. Additionally, vCJD may also be spread through blood during transfusions. As a result, blood banks have worked to minimize risk of transmission through this route.

You're correct in noting that the incubation period for vCJD seems rather long, estimated currently at four to six years. There are varying predictions of what this could mean for countries that have experienced BSE outbreaks or vCJD cases already. But studies aren't yet reliable enough to give firm estimates of the impact that might be expected from known BSE outbreaks during the 1980s and 1990s. Unfortunately, vCJD has no cure, and currently, no agreed-upon treatment. More research is needed not only to develop treatment options, but also to understand the disease itself.

While this may seem worrisome, there are plenty of laws and guidelines intended to keep gelatin manufacturing safe. Gelatin, which is derived from collagen, is a widely-used animal-derived product. Beyond being found in a particularly colorful jiggly dessert, gelatin is frequently used in the manufacturing of pharmaceuticals. Gelatin is indeed made from skin and bones of cattle, as you mention in your question, but the primary raw material for modern gelatin production is actually pig skin. Pigs are not currently known to be affected by BSE or any similar disease.

For cow-based gelatin, the Food and Drug Administration (FDA) has guidelines in place that ban gelatin from being made from high-risk cow parts. Additionally, high-risk cow parts and products

are not allowed to be imported into the US. Aside from cow- and pig-based gelatin products, there are also fish-based and completely vegetarian versions of gelatin. It's also generally thought that the actual production of gelatin eliminates risk of BSE, though studies are still being carried out. It may be helpful to note, as well, that these tests are carried out with concentrations of BSE material thousands of times higher than those likely to be found. Thus, research has concluded that it's extremely unlikely that anyone would contract vCJD through gelatin.

Specifically, you asked about the gelatin content of soft-gel capsules versus that of "hard" pills. The gelatin content of soft-gel capsules differs from hard-gel capsules. According to gelatin manufacturers, the inactive ingredients of a hard capsule contain generally about 30 percent gelatin while a soft capsule is usually between 40 and 45 percent. Tablets (the "hard" pills) may also contain gelatin as a binder and in the coating to make them less powdery. Levels vary, but are less than the amount used in gel caps. You can also find gelatin (in varying levels) in suppositories, dissolvable films, and emulsions (oils). If you feel strongly about avoiding gelatin, talk with your health care provider to determine whether liquids or effervescent without gelatin are available to substitute for tablets or capsules.

If you're still interested in avoiding gelatin, alternatives to pig- and cow-based gelatin do exist, such as kosher gelatin, which is made from fish bones or seaweed. Take note: some gelatin-containing products are marked kosher even though the gelatin is made from cows — try checking with the certifying organization for details. Vegetarian gelatin alternatives include agar (an algae) and carrageenan (a seaweed), which is now often used in commercial products as a thickening agent instead of gelatin. It's possible to avoid using gelatin, but close attention would have to be paid to ingredients in food. For example, gelatin is used as a stabilizer in various dairy products (including ice cream, cream cheese, sour cream, "Swiss style" yogurt), packaged gravies, sauces, lozenges, chewing gums, marshmallows, and is sometimes used to clarify fruit juices, wine, and even beer. Reading the packaging on food products is a quick way let you know whether the product contains gelatin.

As a side note for any readers interested in avoiding gelatin for any purpose, not just internal consumption: gelatin is used in many cosmetic products, ointments, photographic film, and even in producing materials for paintball! So, whether for internal consumption or external use, gelatin is generally considered to be safe (especially from BSE) but may require consistent vigilance to avoid entirely.

Hope this helps!

Alice!

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Published date:

Feb 25, 2005

Last reviewed on:

Jan 19, 2018

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