

Questions and answers on the transfer of TBE viruses through raw milk

BfR FAQ of 27 July 2016

Tick-borne encephalitis (TBE) is a viral disease transferred by ticks in most cases. In severe cases, infection can lead to an inflammation of the central nervous system.

As there are also isolated reports of consumers contracting an infection with TBE through the consumption of raw milk, the Federal Institute for Risk Assessment (BfR) has compiled the following questions and answers on the subject.

What is understood by tick-borne encephalitis (TBE)?

Tick-borne encephalitis (TBE) is a disease of humans caused by a virus of the genus *Flavivirus* in the *Flaviviridae* family. Infection with the TBE virus can trigger a flu-like illness in humans and also inflammations of the central nervous system (meningitis, meningoencephalitis and myelitis) in severe cases. In roughly 1 to 2 percent of these cases, the disease of the central nervous system is fatal in Central Europe, whereas infection with the far eastern virus sub-type proves fatal significantly more often.

Through which channels is TBE transferred?

The TBE virus is transferred by tick bites in most cases, but (domestic) animals can also become infected through tick bites. When this happens, the virus propagates in the body and can be excreted through milk for a period of a few days. It is therefore possible for consumers to contract a TBE infection through the consumption of raw milk.

TBE occurs mainly in spring and summer, depending on the activities of the virus-bearing ticks, but cases of TBE have also been reported in autumn and occasionally in winter too if the weather is warm enough.

Can Lyme disease also be transferred via raw milk?

In addition to TBE, ticks can also transfer the bacterium *Borrelia burgdorferi*, which can cause Lyme disease. Whereas TBE only occurs in certain regions of Germany, the risk of infection with Lyme borreliosis has to be assumed in all parts of the country. To date, however, no cases of Lyme disease have been reported after the consumption of raw milk.

In which countries and regions does TBE occur?

Ticks, which transfer the TBE virus, are to be found in many European countries as well as in Russia and Asia. On the basis of documented cases of TBE, the Robert Koch Institute (RKI) publishes maps every year showing the TBE risk areas in Germany. The TBE endemic areas in which a significantly increased risk of infection is substantiated by periodic cases of disease are defined as risk areas.

The most significant TBE risk areas in Germany are in the federal states of Baden-Württemberg, Bavaria and southern parts of Hesse and Thuringia. In addition to this, certain administrative districts in Rhineland-Palatinate (Birkenfeld district), Saarland (Saar-Pfalz district) and Saxony (Vogtlandkreis district) are also affected. The RKI has published an updated map of the TBE risk areas in Germany on its website: www.rki.de/TBE

What significance do infections caused by TBE in milk have in Germany?

Compared to transmission of the TBE virus through tick bites, cases of disease after the consumption of raw milk are very rare. There were isolated reports of outbreaks of disease in 2005 and 2006 after the consumption of raw goat's milk from Estonia, Latvia and Slovakia. 4

people took ill in Austria in 2008 after eating a cream cheese made from raw goat's milk. Two TBE cases have been reported in Baden-Württemberg in 2016 after the consumption of raw goat's milk. No cases of illness are known which could be attributable to the consumption of pasteurised or high heat-treated milk.

How can people protect themselves from TBE?

A TBE vaccination is available. The Standing Committee on Vaccination (STIKO) at the Robert Koch Institute recommends vaccination for persons exposed to ticks in TBE risk areas, as well as persons who are at risk of coming in contact with TBE through their work, such as forestry and agriculture workers.

How can consumers protect themselves against TBE viruses in milk?

TBE pathogens are sensitive to heat and are killed off reliably by heating the milk sufficiently, e.g. through pasteurisation, ultra-high heat treatment or boiling. Risk groups should also only consume certified raw milk after boiling. As a general rule, raw milk should be heated before consumption.

Are there any population groups who are particularly endangered by a TBE infection?

Illness can be particularly severe among older people and those with certain underlying diseases, such as immune deficiency. Senior citizens in particular are more susceptible to complications with TBE. For these reasons too, these risk groups should only consume certified raw milk after it has been boiled. As a general rule, raw milk should be heated before consumption.

What legal provisions are there for the sale of raw and certified raw milk in Germany?

Because raw milk is sold to consumers without any homogenisation or heat treatment (e.g. pasteurisation) and with its natural fat content, it can contain disease-causing bacteria, such as *Salmonella*, *Campylobacter*, enterohaemorrhagic *Escherichia coli* (EHEC) or viruses. Some of these so-called zoonotic pathogens can cause severe diseases.

To protect against diseases, the sale of raw milk is fundamentally forbidden in Germany. An exception to this is "farmhouse milk". Farmers who offer "farmhouse milk" for sale do not have to satisfy any particular hygiene requirements, but they must clearly post the notice "Raw milk – boil before consumption" at the point of sale.

Another exception is the sale of so-called "certified raw milk", a packaged milk from specially controlled cows which is sold in retail outlets. Although certified raw milk may be consumed raw thanks to the special hygiene regulations and controls, it cannot be completely ruled out that it contains pathogens which can cause infections in particularly sensitive persons. The packaging of certified raw milk must contain the notice that the milk may be stored at a maximum temperature of 8°C along with the term "raw milk" and the use-by date. The use-by date indicates the date by which particularly perishable foods should be eaten.

What rules apply to foods made from raw milk?

All foods made from raw milk must be marked accordingly. Packaged cheese products, for example, must contain the note "Produced with raw milk". If this note is not applied, the cheese was made from pasteurised milk. The majority of all German cheese varieties are made from pasteurised milk. Typical German raw milk cheeses are varieties such as *Allgäuer Bergkäse* und *Emmentaler*, but the majority of any bacteria which these hard cheese varieties may still contain do not survive the long maturation period.

Cream cheese, on the other hand, is non-matured cheese which is usually made by curdling heat-treated (pasteurised) or skimmed milk. It can be consumed directly after production and includes varieties such as quark, fresh cream cheese, cottage cheese and layered cheese.

You will find additional notes on the consumption of raw milk and on protection against food-borne infections at:

<http://www.bfr.bund.de/cm/349/questions-and-answers-on-the-consumption-of-raw-milk.pdf>

<http://www.bfr.bund.de/cm/349/questions-and-answers-on-protection-against-foodborn-infections-in-private-households.pdf>

This text version is a translation of the original German text which is the only legally binding version.