German Federal Institute for Risk Assessment

FAQ

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Brucella in food – identifying and avoiding sources of infections

→ Changes compared to the version of 12 June 2014: Additional information has been added to individual answers

Worldwide, brucellosis is among the most common bacterial diseases that can be transferred from animals to humans. The most important transmission path is the consumption of raw milk or cheese made from raw milk or, less frequently, the consumption of raw meat.

In central and northern Europe, brucellosis has been successfully controlled in production animals and is now rarely found. In consequence, hardly any humans in these countries contract this type of infection anymore. In Germany, cattle, sheep and goat populations have officially been deemed to be free of brucellosis since the year 2000; only in pig populations are outbreaks sporadically reported.

However, humans are at risk of contracting an infection through the consumption of animal-derived foods which have been produced in parts of the Mediterranean area, the Arabian Peninsula, in the Middle East, Africa as well as in Central and South America. To protect themselves from brucella infection, consumers should refrain from consuming raw milk, dairy products and meat when travelling to these regions. This also applies to foods such as goat or sheep cheese which are exported from endemic areas.

What are brucellae?

Brucellae are bacteria that do not form spores but are resistant nevertheless. Among other things, they can survive outside the host in chilled raw milk or yoghurt for several days and in water at room temperature for several weeks to months. Brucella can cause infections in both humans and animals. However, not all species are pathogenic to humans. The Brucella species *Brucella melitensis* (sheep and goat brucellosis) and *Brucella abortus* (bovine brucellosis) are responsible for most infections in humans. *Brucella suis*, the pathogen responsible for swine brucellosis, is detected much less frequently in humans.

What is brucellosis?

Infections caused by *Brucella* are referred to as brucellosis. Worldwide, brucellosis is among the most common bacterial infections that can be transmitted from animals to humans ("zoonoses"). Affected persons suffer from influenza-like symptoms including fever, shivering, loss of appetite and fatigue. Undulating fever phases over a longer period of time is a typical symptom of untreated brucellosis. The probability of dying from an untreated brucella infection is low (less than 2%). However, chronic brucellosis can lead to diseases of the organs, such as endocarditis.

How is brucellosis transmitted to humans?

Brucellosis is transmitted to humans predominantly from sheep, goats, cattle and, more rarely, pigs. The pathogens are either transmitted directly from animals to humans or via animal-derived foods. Human-to-human infection is very rare.

What foods cause *Brucella* infection?

Brucella can be transmitted to humans through raw foods derived from infected animals. Most infections are caused by the consumption of raw goat or sheep milk or by cheese or other products made from raw milk.

Does the pathogen exist in Germany?

The number of patients ill with brucellosis depends on the extent to which the production animals of a country are affected by *Brucella*. In Germany, cattle, sheep and goat populations, are considered to have been free of *Brucella* since 2000. In pig populations, *Brucella* outbreaks occur sporadically.

However, this is caused by bacteria of the *Brucella suis* species, which only rarely lead to human infection. *Brucella suis* Biovar 2 is primarily found in wild boar and hares, but can also be transmitted to humans and domestic pigs. Brucellosis is a notifiable disease. From 2001 to 2022, between 20 and 60 cases of brucellosis were reported in Germany each year. In 2023, 71 cases of newly infected persons were reported. Most of the patients had contracted the infection during a stay in an endemic area abroad. In most cases, the consumption of raw goat milk or raw sheep milk was the cause of the infection.

In what regions does a risk of infection from raw foods exist?

Brucellosis is notably found in the Mediterranean area, on the Arabian Peninsula, in the Middle East, in Africa and in Central and South America. Worldwide, up to 500,000 cases of newly diagnosed patients are reported every year.

The most important measure to prevent *Brucella* infections in the long term is to control brucellosis in animal populations. In northern and central Europe, *Brucella* in animals has been almost eradicated through consistent surveillance and control. The number of infected humans in those countries is correspondingly low. In some countries bordering on the Mediterranean, *Brucella* continue to be frequently found in animal populations. Within Europe, Portugal, Spain, the South of Italy, Greece and Turkey in particular are affected.

How can consumers protect themselves from food-borne *Brucella* infection?

Consumers can protect themselves from *Brucella* infection from food by refraining from consuming raw milk and meat. Food should be heated to 72 °C for at least two minutes. This recommendation is particularly relevant for raw goat and sheep milk and raw milk products derived therefrom such as cheese produced in endemic areas. This recommendation not only applies when travelling to these areas but also to the consumption of foods that are exported from these regions, for example to Germany.

Further information on the BfR website

Foodborne infections - general information
https://www.bfr.bund.de/en/foodborne_infections-317029.html

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. The BfR advises the Federal Government and the States ('Laender') on questions of food, chemicals and product safety. The BfR conducts independent research on topics that are closely linked to its assessment tasks.

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Publisher:
German Federal Institute for Risk Assessment
Max-Dohrn-Straße 8-10
10589 Berlin, Germany
T +49 30 18412-0
F +49 30 18412-99099
bfr@bfr.bund.de
bfr.bund.de/en

Institution under public law
Represented by the president Professor Dr Dr Dr h. c. Andreas Hensel
Supervisory Authority: Federal Ministry of Food and Agriculture
VAT ID No. DE 165 893 448
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