Advice 11-2013 of the Scientific Committee of the FASFC on the evaluation of the risks and benefits of the consumption of raw milk from animal species other than cows

In this opinion, the risks and benefits of the consumption of raw milk from animal species other than cows (e.g. equine, donkey, sheep, goats, etc.) as well as the effect of a thermal treatment on these risks and benefits are qualitatively evaluated based on scientific literature and expert opinion, and this from both a microbiological and a (bio)chemical and nutritional point of view.

The microbiological risks of raw milk from animal species other than cows were qualitatively evaluated based on the pathogenic microorganisms that can be found on the dairy farms, outbreaks caused by the consumption of raw milk reported, reported frequencies of occurrence of the pathogenic microorganisms in raw milk and an estimate of the severity of the adverse effects on human health of these microorganisms.
The consumption of raw milk holds a risk for public health due to the possible contamination with human pathogenic microorganisms. These microorganisms may originate from animals (and even from clinically healthy animals) or from contaminated the environment during the collection or storage of the milk. In Belgium, the contamination of raw goat and sheep milk with human pathogenic *E. coli* and *Campylobacter* spp. holds the greatest risk for the consumer. On the other hand, raw milk from horses and donkeys holds a low risk of infection because of the high microbiological quality, associated with the low total bacterial count. Also, several pathogenic microorganisms that were detected in raw goat or sheep milk, were not shown to appear in raw horse or donkey milk. However, the latter can transfer certain species of human pathogenic *Streptococcus*.
In raw milk from animal species other than cows from other countries some additional risks may exist. The tick-borne encephalitis virus (TBEV) in raw goat milk holds a high risk in Eastern Europe and *Brucella* spp. in raw camel milk holds a high risk in Asia.
A heat treatment is the most effective way to increase the microbiological safety of milk. However, the pasteurization process cannot eliminate all pathogenic microorganisms or toxins. On the other hand, sterilization or UHT treatment can achieve this, but a few heat-stable spores and toxins are not eliminated. This leads thus to a commercially sterile product, free from pathogenic microorganisms.
With regard to the microbiological benefits of raw milk, the presence of lactic acid bacteria in raw milk will limit the growth of bacteria (including pathogens), but this inhibitory effect is insufficient for pathogens with a low infectious dose. Lactic acid bacteria are inactivated by pasteurization, sterilization and UHT treatment. After pasteurization, bacterial pathogenic spores can germinate and grow in the pasteurized milk without hindrance from the lactic acid bacteria. The same is true for vegetative pathogenic bacteria, which end up in the milk through a post-contamination after the thermal treatment. However, for sterilized and UHT treated milk this is not a problem as such milk is commercially sterile. Nevertheless, filling of UHT treated milk in a high care zone is necessary to avoid post-contamination. Otherwise, the relevance and the number of these bacteria in raw milk would be too limited in order to have a beneficial physiological effect on the consumer. Inactivation of these bacteria by thermal treatment will therefore have no impact on human health.
With the exception of possible process contaminants or environmental contaminants, there are no (bio)chemical hazards associated with the consumption of raw milk. With respect to the (bio)chemical and nutritional benefits, the composition of milk from different animal species (and of human milk) were compared. Although milk of all mammals contains the same main components, a large variation exists in milk composition, not only between ruminants and non-ruminants, but also between the different species of the same “group”, between different varieties within the same species, and between individual animals. Very generally, it can be stated that milk from ruminants contains a higher protein (“casein milk”), fat (absolute and % less polyunsaturated fatty acids (PUFAs) and more saturated fatty acids and monounsaturated fatty acids (MUFAs)), and mineral content compared to milk from non-ruminants (“albumin milk”). The content of most vitamins is higher in ruminant milk as well (an exception is e.g. the higher vitamin C content of horse milk). Ruminant milk has however, a lower lactose content. The differences in milk composition do not only concern the relative proportions of the milk components, but also occur at the molecular level (e.g. monomeric versus dimeric proteins, different amino acid sequence). The variation in milk composition between individual animals belonging to the same species is flattened out due to the collection and mixing of different milk lots (cf. scale of commercialization).

Information on the effect of a heat treatment (pasteurization conditions in particular) on the milk components from animal species other than cows is scarce. Despite the fact that the composition and the thermal stability of certain components may differ between the considered types of milk, the main conclusions of the opinion 15-2011 of the Scientific Committee, where the effect of a heat treatment on the risks and benefits of the consumption of raw cow milk was discussed, can be extrapolated to milk from other species. Thus it can be assumed that the nutritional benefits associated with the consumption of raw milk (e.g. calcium, phosphor, proteins and essential amino acids (especially lysine), and a number of vitamins) are generally maintained after pasteurization or UHT treatment (changes of technological nature such as e.g. emulsifying and water binding properties of proteins, were not considered). The other nutrients in milk that may (partially or fully) or may not be destroyed by heating, contribute less to the daily nutritional needs. The main negative effect of biochemical nature of a heat treatment is the modified organoleptic profile of milk, although this is more a matter of individual perception.
Other arguments against heat treatment of milk, including a less good digestibility of milk, an inactivation of useful enzymes and an increased risk of various diseases (e.g. milk allergy, lactose intolerance), were largely refuted and/or and/or strongly nuanced in the current opinion and in opinion 15-2011 of the Scientific Committee. For a founded evaluation of putative therapeutic or health promoting effects associated with the consumption of a certain type of raw milk and of the impact of a heat treatment on these effects, not only a confirmation of these effects is needed (sufficiently large, epidemiological studies that study the effects of raw milk on health are nearly nonexistent), but also an identification of the milk components responsible for these effects. The interaction of these components with other milk components has to be accounted for as well.
Despite the fact that there are some similarities with human milk, horse, donkey, goat milk or milk from other species are no viable alternatives for human milk. For children younger than 1 year, it is recommended to give either human milk or commercial milk (which is subject to legislative provisions and control). For people suffering from milk allergy, these types of milk can offer an alternative. However, given the complexity of the issue, individual tests (e.g. provocation test) are required to give a definitive answer.

The Scientific Committee warns to carefully deal with the consumption of all types of raw milk for the population in general and in particular for the YOPI group (young, old, pregnant, immunocompromised). People who travel abroad have to be even more carefully with the local consumption of raw milk. It is recommended to heat raw milk (e.g. by briefly heating it to boiling temperature) before its consumption. Raw horse and donkey milk has a high microbiological quality, but there is no sufficient information available to conclude that the risk is entirely negligible. Heating of such milk by e.g. pasteurization can considerably reduce the risks.
Milk, cow milk or milk from other animal species, fits a classic recommended diet. Milk can be a supportive food with certain disorders or diseases, but is not a cure. Scientific studies showing that milk or milk of certain species in particular may reduce the risk of certain diseases or cure them, are so far lacking.

The full text is available on this website in dutch and in french, respectively under the section “Wetenschappelijk Comité/Adviezen” and “Comité scientifique/Avis”.