Briefing for the Citizen Participation and Public Petitions Committee on petition PE1978: Allow raw milk to be sold in Scotland

Brief overview of issues raised by the petition

The petition is "Calling on the Scottish Parliament to urge the Scottish Government to allow raw drinking milk to be sold in Scotland, bringing it in line with England, Wales and Northern Ireland, and allow farmers the opportunity to sell unpasteurised drinking milk."

The petitioner states that "The sale of raw drinking milk is legal in England, Wales, Northern Ireland, and most European countries. It has higher nutritional value and it can be better tolerated than pasteurised milk. In my view, there is no reason why the Scottish Government should forbid customers who want to acquire this product from their trusted source from being able to do so."

- Raw milk is milk which has not been pasteurised. Pasteurisation is the process of heat-treating milk to remove bacteria.

- Because raw milk has not been pasteurised it carries a higher risk of containing harmful bacteria which can cause serious food poisoning, such as E.coli, Campylobacter, Salmonella and Listeria, particularly among children and other vulnerable groups. For this reason, it is not permitted to sell unpasteurised milk or cream from any farmed animal in Scotland.

- There is therefore a risk in drinking unpasteurised milk, though countries which permit regulated sales of raw milk (among them, England, Wales and Northern Ireland) seek to lower the risk through testing and other safeguards. Some level of risk remains despite these safeguards, however. The Food Standards Agency (covering England, Wales and Northern Ireland) advise against vulnerable groups consuming raw milk.

- Pathogens such as E.coli bacteria can be transmitted from food to a person, as well as from person-to-person. Therefore, regulating raw drinking milk aims to protect both those who consume milk directly, and wider public health.

- There has been a growing interest in consuming raw milk in parts of the UK, as well as in other parts of the world. The volume of production and consumption in England, for example, has grown over the last ten years; consumer research in 2018 indicated that the main driver of consumption was perceived health benefits. Outbreaks of food-borne illness have increased alongside greater consumption.

- Whether or not there are benefits to consuming raw, unpasteurised milk is a complicated topic which remains the subject of scientific study, disagreement, and uncertainty. Some of these areas of research are addressed below.

- This briefing does not attempt to review all available evidence, but rather provides a snapshot of the debate and research around this topic.

It is not permitted to sell raw milk or cream in Scotland (as per Schedule 6 of the Food Hygiene (Scotland) Regulations 2006). It is permitted to sell cheeses made from unpasteurised milk, provided the rules are followed. This briefing does not deal any further with raw milk cheeses.

- In relation to raw drinking milk and cream, Food Standards Scotland states that:

  "The Scottish policy of mandatory pasteurisation is consistent with the Advisory Committee on the Microbiological Safety of Food advice, who recommend pasteurisation as the key critical control point in the prevention of milk borne disease. It is also in line with the recommendations of the E.coli Task Force Report from 2001, commissioned after 21 people died in a major food poisoning outbreak in Wishaw in 1996, which highlighted the raw milk ban in Scotland as a positive step in protecting consumers from the risks of E.coli O157. Mandatory pasteurisation also protects the wider community, as milk borne pathogens such as E.coli O157 are known to be transmitted through person to person contact.

  "The most recent scientific review, published in January 2015, was conducted by experts from the European Food Safety Authority's (EFSA) Panel on Biological Hazards. This scientific opinion on public health risks associated with raw milk in the EU concludes that raw milk can be a source of harmful bacteria – mainly Campylobacter, Salmonella and Shiga toxin-producing Escherichia coli (STEC) - including E. coli O157 - and Listeria monocytogenes. The EFSA opinion identifies further hazards but these are not considered to be a significant risk in Scotland or the UK.

  "Given the historical evidence and weight of expert scientific opinion in favour of mandatory pasteurisation, there are currently no plans to lift the ban on direct sales of raw drinking milk in Scotland."

It is permitted to sell raw milk in England, Wales and Northern Ireland, though sales are regulated and restricted.

- Raw drinking milk may not be sold in supermarkets or high-street retail settings, and may only be sold by registered farmers e.g. direct from the farm or at farmers markets, among other places.

- The Food Standards Agency states that:

  "Hygiene regulations are in place to protect consumers. Raw drinking milk offered for sale must be:

  - "from animals that are healthy and free from brucellosis and tuberculosis
  - "from a farm that complies with hygiene rules and is routinely inspected twice a year
  - "labelled with the appropriate health warning

  "Our inspectors also undertake a verification sampling programme of raw drinking milk. Testing is carried out on behalf of the FSA by Public Health England.

  "We regularly review the controls on raw drinking milk and cream. We want to support consumer choice but have to balance this alongside protecting the health of the public."

- As noted above, the Food Standards Agency recommends against drinking raw milk for more vulnerable groups, including children, people over 65, people with certain conditions, and people who are pregnant.

Research is ongoing into the risks and potential benefits of drinking raw milk. Many studies found that there are realistic risks from drinking raw milk. There does not appear to be conclusive evidence that raw milk is more nutritious; the conclusions around other potential benefits are evolving but are as yet unclear.

- The Food Standards Agency (FSA) carried out an assessment of available evidence on benefits of raw drinking milk during its 2015 policy review (summarised in a 2018 FSA board paper):

  "During the last policy review an assessment was conducted of available evidence of any nutritional benefits associated with the consumption of raw milk compared with consumption of pasteurised milk. It concluded that there is little available evidence to indicate that pasteurising milk substantially alters its nutritional composition and that there was insufficient evidence to show the effect of pasteurisation on the functional properties of nutrients in milk.

"Research on RDM and potential connections with allergic disease are inconclusive, with many confounding factors. Although some studies have shown that children growing up on farms are at a reduced risk of developing allergic diseases such as asthma, hay fever, food allergy and atopic dermatitis, the effects observed were likely to be multifactorial in origin and no single specific factor has been consistently identified in conferring these protections.

"As no consensus exists regarding any allergenic benefits from the studies conducted to date, we would continue to not recommend the consumption of raw milk to prevent allergic disease. Further, any proven benefits would still have to be considered against possible adverse effects due to potential pathogen consumption."

- A 2015 review of the risks and benefits of drinking raw milk in the USA found that "In some studies, up to a third of all raw milk samples contained pathogens, even when sourced from clinically healthy animals or from milk that appeared to be of good quality." In relation to health claims, the study found that:

  "Claims related to improved nutrition, prevention of lactose intolerance, or provision of "good" bacteria from the consumption of raw milk have no scientific basis and are myths. There are some epidemiological data that indicate that children growing up in a farming environment are associated with a decreased risk of allergy and asthma; a variety of environmental factors may be involved and there is no direct evidence that raw milk consumption is involved in any "protective" effect."

- A 2013 review by Belgian researchers found that "consumption of raw milk poses a realistic health threat due to a possible contamination with human pathogens. It is therefore strongly recommended that milk should be heated before consumption." In relation to potential health benefits from raw milk, the study concluded that:

  "With the exception of an altered organoleptic profile, heating (in particularly ultra high temperature and similar treatments) will not substantially change the nutritional value of raw milk or other benefits associated with raw milk consumption."

- "Organoleptic profile" means the taste, smell, etc of a product. These researchers found that with the exception that pasteurisation changes the taste, smell, etc of the milk, the process of heat-treating does not substantially change the benefits of consuming milk.

- A 2017 review of disease outbreaks associated with unpasteurised milk in the US between 2009 and 2014, found that illness is far more likely from unpasteurised dairy products than those that had been pasteurised: "Unpasteurized dairy products…cause 840 (95% CrI 611–1,158) times more illnesses…than pasteurized products"

- A 2019 review of microbiology results from tests on raw dairy products in England between 2013 and 2019 found that "Results from routine monitoring were satisfactory for 62% of milks, 82% of cream, 100% of ice-cream, 51% of butter, 63% of kefir and 79% of cheeses, with 5% of all samples being considered potentially hazardous…These data highlight the public health risk associated with these products and provide further justification for controls applied to raw drinking milk and dairy products made with unpasteurised milk."

- One 2011 study reviewed the effects of pasteurisation on vitamins and other health benefits from milk. The study found that:

  "Forty studies assessing the effects of pasteurization on vitamin levels were found. Qualitatively, vitamins B12 and E decreased following pasteurization, and vitamin A increased. Random effects meta-analysis revealed no significant effect of pasteurization on vitamin B6 concentrations…but a decrease in concentrations of vitamins B1…B2…,C…, and folate…The effect of pasteurization on milk's nutritive value was minimal because many of these vitamins are naturally found in relatively low levels. However, milk is an important dietary source of vitamin B2, and the impact of heat treatment should be further considered. Raw milk consumption may have a protective association with allergy development (six studies), although this relationship may be potentially confounded by other farming-related factors. Raw milk consumption was not associated with cancer (two studies) or lactose intolerance (one study)."

- The authors also concluded that "Overall, these findings should be interpreted with caution given the poor quality of reported methodology in many of the included studies".

There is ongoing research into the potential 'protective' effects of raw milk against developing immune-related conditions such as allergies, asthma or eczema (i.e. whether or not drinking raw milk may result in a decreased probability of developing these conditions).

- Some studies have suggested that raw milk consumption may protect against developing some allergies or asthma due to a lower prevalence of these diseases among children who grow up on farms.

- A 2007 study surveyed children from farm environments as well as a control sample and found that "consumption of farm milk may offer protection against asthma and allergy. A deepened understanding of the relevant protective components of farm milk and a better insight into the biological mechanisms underlying this association are warranted as a basis for the development of a safe product for prevention". 'Farm milk' is milk that comes direct from the farm, but it may be consumed raw or boiled at home.

- The researchers were clear, however, that the study could not evaluate whether the lack of pasteurisation causes this protective effect, and that the study could not evaluate the effect of pasteurised vs raw milk. They said:

  "The present study does not allow evaluating the effect of pasteurized vs. raw milk consumption because no objective confirmation of the raw milk status of the farm milk samples was available. Parental answers to a question on consumption of boiled vs. raw farm milk are likely to be biased due to the social desirability of responses because raw milk consumption is not recommended especially for young children. About half of the parents indicated that they usually did not boil the milk before consumption but no differential effects were observed between those boiling and those not boiling the milk. This might be a result of biased parental answers or may indicate that pasteurization is not of key importance because compounds other than microbes may play a role".

- The researchers also did not dispute the risks of consuming raw milk, and therefore suggested that further research was needed on the 'protective' aspects of farm milk – in other words, what it is about raw milk that is associated with protection from allergy and asthma. They concluded that "at this stage, consumption of raw farm milk cannot be recommended as a preventative measure". They said:

  "In conclusion, the results of the present study indicate that consumption of farm milk is associated with a lower risk of childhood asthma and rhinoconjunctivitis. These results might be transferred to non-farming populations as they were observed in all subpopulations of the…study. Dietary interventions are an attractive means for primary prevention. However, raw milk may contain pathogens such as salmonella or EHEC [a strain of E.coli], and its consumption may therefore imply serious health risks [24]. A deepened understanding of the relevant 'protective' components of farm milk and a better insight into the biological mechanisms underlying this

association are warranted as a basis for the development of a safe product for prevention. At this stage, consumption of raw farm milk cannot be recommended as a preventive measure."

- As a result of the associations found between raw milk and fewer allergies and other immune issues, some researchers have stated that it is important to further research the mechanisms which may bring about this protective effect as only then can a safe and protective milk be developed, but researchers have also highlighted the ethical difficulties in doing research in children due to the risks of consuming raw milk. As noted above, children are particularly vulnerable to food-borne pathogens and are not recommended to drink raw milk.

- A 2019 review set out the available evidence around the different ways that raw milk may offer some protective effect, highlighting that "the exact mechanisms underlying this association are still not well understood". The conclusion of the review acknowledged both the ongoing debate around raw milk and the potential for further research. It stated:

  "There is a debate about the role of raw cow's milk role in human health. Sceptics say that raw milk carries a significant risk of bacterial pathogens infection and there is no clear evidence that raw milk has any nutritional benefits compared to pasteurized milk. Enthusiasts see in milk the hope for effective prevention of allergic diseases and even respiratory tract infections [73]. There is no doubt that the components of raw milk can influence the immune function, but the final proof based on controlled studies in infants is not possible due to ethical reasons. Undoubtedly, even if the final understanding of the role of raw cow's milk seems to be a distant prospect, it is one of the most intriguing and promising paths to be studied in allergy prevention."

- A 2021 commentary piece in response to a journal article on the prevention of cow's milk allergy highlighted the potential of "raw, unpasteurized farm milk or more gently processed milk" and that advancements may result in a greater ability to produce microbiologically safe raw milk. The authors suggested that "Future research is a must to unravel how safe milk derived products may be produced without damaging important immune modulators." It should be noted however that the authors of the study which the commentary referred to disagreed that there was enough evidence for the protective effects of raw milk to justify the risk of serious illness associated with consuming raw milk.

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