

Opinion 01-2023 of the Scientific Committee established at the FASFC on salicylic acid residues in products of animal origin

Background & Terms of reference

The presence of salicylic acid residues was repeatedly detected in milk samples sampled by the FASFC and the sectors MelkBe, FEBEV and Algemeen Boerensyndicaat. However, in most cases, investigations by the FASFC's Local Control Units (LCE) could not identify medical treatment or the use of a biocide that could be linked to the presence of these residues. The sectors therefore question the possibility of an origin other than medical treatment of the animals or the use of biocides, in particular through plants consumed by grazing animals or supplementary feed.

For these reasons, the Scientific Committee is asked to provide an opinion on the occurrence of salicylic acid residues in products of animal origin. In particular, it is envisaged to obtain answers to the following questions:

- What are the possible natural sources of salicylic acid residues in products of animal origin, and particularly in milk and muscle?
- Is it possible to distinguish between possible natural sources and exogenous administration of salicylic acid?
- What are the animal health and food safety risks associated with the presence of salicylic acid residues in products of animal origin, and can management options be recommended to reduce the risk of occurrence of such residues?

Method

The advice is based on expert opinion, on data from control plans (FASFC monitoring 2017-2021 and Member State reports between 2018 and 2020) or sectoral plans and on a study of scientific literature.

Conclusions

Salicylic acid is a pharmacologically active substance authorised as a veterinary medicine, but is also present in biocidal products authorised in Belgium. Exceedances of maximum residue limits (MRLs) resulting from the administration of veterinary medicines or the application of biocides cannot be ruled out, but would rather be related to incorrect use of veterinary medicines (incorrect dose administered, non-compliance with the withdrawal period or target species, etc.) or biocides (failure to rinse or incomplete rinsing, use of unauthorised biocides for milking installations, accumulation of residues due to simultaneous use of several biocides containing salicylic acid in the same period, etc.).

However, it should be pointed out here that the MRL defined for milk is extremely low and that this value is the subject of discussion within the network of European Reference Laboratories.

Salicylic acid is also a natural component of plants. Amongst feed crops, lucerne hay (485 mg/kg), clover hay (32 mg/kg) and maize (up to 12.8 mg/kg) have been identified as potentially important sources of salicylic acid in cattle. Amongst wild species, willow bark (up to 3000 mg/kg) is also an important source. The listed salicylic acid concentrations in these plant sources should be interpreted with caution, as they may vary considerably from variety to variety, and depend on the part of the plant involved (leaves, flowers, seeds), stress or geographical origin and growing conditions.

With regard to possible transfer of salicylates ingested through feed to animal tissues, relatively few studies are available. Although studies have been conducted for ruminants in the context of veterinary drug registration, there are no studies that have investigated transfer from animal feed. It is important to note that in polygastric animals such as dairy

cows, salicylic acid is mainly retained in the rumen by ion trapping and transfer to plasma is therefore very limited. This particularity of ruminants makes it possible to reduce absorption by a factor of 1000 and therefore reduces the concentrations present in the tissues and in the milk.

On the basis of a daily ration in accordance with good agronomic practice, it was estimated that an adult bovine could consume about 2 g of salicylic acid per day through its feed. Based on the available information, these amounts are not expected to lead to the MRL being exceeded.

When ingested at high doses (> 700 mg/litre plasma), salicylates can cause severe toxicity to human health. However, the levels found in plants and feed do not represent a risk to human or animal health.

In the opinion of the Scientific Committee and according to the current state of knowledge, the presence of salicylic acid residues in milk following the consumption of plants containing a high level of salicylic acid is unlikely, even in cases of consumption of plant materials very rich in salicylic acid.

Salicylates hydrolyse to salicylic acid *in vivo*. Consequently, it is impossible to determine whether salicylic acid detected in a sample was originally salicylic acid, acetylsalicylic acid, methylsalicylic acid or another salicylate. For the same reason, it is currently impossible to distinguish in ruminants between salicylic acid of feed (natural) or non-feed origin (drug treatment or biocide residues). For the Scientific Committee, it nevertheless is logical to examine the non-feed origin first, given the concentrations that can be achieved in certain biocides (0.1 to 0.5%) or drugs (660 mg/g methyl salicylate) in comparison with the concentrations present in animal feed.

Recommendations

To the authorities

In cases of non-conformities and in addition to investigations into the improper use of drugs or biocides, the Scientific Committee recommends also checking whether a lucerne-rich feed was given to the animals and whether willow-based feed supplements were used. In addition, due to the limited number of studies found on the salicylic acid content in lucerne and due to the importance of lucerne in animal feed, it may be recommended to conduct further studies on the salicylic acid content of this plant source.

In addition, the use of biocides and compliance with their conditions of use should also be monitored. Ideally, warnings about the use of salicylic acid should be included in the technical data sheets or authorisation documents of biocidal products, pointing out the possibility of it being found in milk or meat.

In order to establish the possible transfer rates from feed to animal products, further studies should be carried out, especially in ruminants.

Furthermore, the Scientific Committee recommends the development of analytical tools allowing to distinguish between a feed (natural) origin and an exogenous origin (medical treatment or contamination with biocides) of salicylic acid residues in animal tissues and more specifically in milk.

In view of the recent detections, the Scientific Committee recommends that trends in the detection of salicylic acid in bovine milk should be analysed in the coming years and that epidemiological studies should be carried out as thoroughly as possible into the potential causes of MRL exceedance.

The full text is available on this website in dutch and in french.