

REPORT OF THE SCIENTIFIC COMMITTEE FOR ANIMAL NUTRITION
ON THE USE OF HYDROCHLORIC AND SULPHURIC ACIDS
IN FEEDINGSTUFFS

Opinion expressed 15 January 1980

TERMS OF REFERENCE (March 1979)

The Scientific Committee for Animal Nutrition is requested to give an opinion on the following questions :

1. Do hydrochloric and sulphuric acids, added at low levels to feedingstuffs, act as preservatives ?
2. Can they have harmful effects on the animal organism ?
3. Can they have adverse effects on the quality of animal products ?
4. Taking into account the answers to the abovementioned questions, should the use of these acids in feedingstuffs be continued, and if so, should the conditions of use be restricted ?

BACKGROUND

According to the provisions of Council Directive 70/524/EEC, of 23 November 1970, on additives in feedingstuffs (1), as last amended by the twenty-sixth Commission Directive of 18 December 1978 (2), Member States are authorized to make use, by way of derogation until 31 December 1979, of hydrochloric and sulphuric acids for ensilaged feedingstuffs.

Authorization to use these products as preservatives in feedingstuffs, without specific conditions of use, was requested by one Member State.

(1) OJ No L 270, 14.12.1970, p. 1

(2) OJ No L 39, 14.02.1979, p. 11

OPINION OF THE COMMITTEE

1. The use of mixtures of mineral acids, particularly technical grade hydrochloric and sulphuric acids, for the preservation of ensilaged fodders goes back to the period 1930-1935. This method, which is known to be effective, consists of acidifying the fodders with a quantity of 5 - 10 % of mineral acids, diluted so as to obtain a pH of 3-4.

More recently, it has been reported that the addition of 1 - 3 % concentrated hydrochloric or sulphuric acid (mixed with phosphoric acid) to liquid molassed feedingstuffs supplemented by non-protein nitrogen compounds enhanced the effectiveness of these compounds in ruminants. It is likely that this beneficial effect results from a better distributed daily consumption of non-protein nitrogen compounds. It is known that the acidification of feedingstuffs leads to a less massive and more frequent feed consumption in ruminants and that this method of feeding favours the assimilation of non-protein nitrogen compounds.

2. The use of hydrochloric and sulphuric acids under the conditions of use recommended for the preservation of ensilaged fodders does not present any danger for ruminants. The cases of acidosis and demineralization observed resulted either from an excessive consumption of acidified fodder or from feeding which was deficient in alkaline salts.

The addition of 1 - 3 % hydrochloric or sulphuric acid to liquid molassed feedingstuffs, supplemented by non-protein nitrogen compounds, does not appear likely to produce metabolic disturbances. The consumption of these feedingstuffs by ruminants is limited. In addition the presence of heavy metals or other impurities in the technical grades of these acids (cf. Tables I and II) does not pose any problem at the levels at which these acids are used in feedingstuffs. According to the provisions of Council Directive 74/63/EEC of 17 December 1973 on the fixing of maximum permitted levels for undesirable substances and products in feedingstuffs (1), the maximum levels of arsenic, lead, fluorine and mercury tolerated in feedingstuffs for adult bovine animals are 2, 5, 50 and 0.1 mg/kg compound feedingstuff, respectively.

(1) OJ No L 38, 11.02.1974, p. 31

Table I

Average levels of impurities in concentrated hydrochloric acid of technical quality	
SO ₃	50 ppm
Cl ³ (free)	0 - 20 ppm
Fe	0 - 10 ppm
Pb	none
As	none
Cu	none
F	none
Dry residue	0.04 %

Table II

Levels of impurities in sulphuric acid (66°B) of technical quality	
Calcination residue	max. 0.01 %
SO ₂	max. 0.0003 %
Ammonium nitrogen	max. 0.0002 %
Nitric nitrogen	max. 0.0003 %
Cl	max. 0.0005 %
As	max. 0.00001 %
Fe	max. 0.002 %
Organic Matter	max. 0.0005 %
Sb	max. 0.0002 %
Mn	max. 0.00002 %
Cu	max. 0.0002 %
Zn	max. 0.004 %
Se	max. 0.0015 %
Pt	none
Ni	max. 0.00005 %
Ag	none
Co	max. 0.00015 %
Dry residue	max. 0.008 %
Ba	0.1 mg/l
Cd	< 0.01 mg/l
Cr	0.08 mg/l
Hg	< 0.01 mg/l
Pb	0.18 mg/l
F	< 1 mg/l

3. The addition of hydrochloric or sulphuric acid to ensilaged fodders or liquid molassed feedingstuffs containing non-protein nitrogen compounds is without effect on the quality of the animal products.
4. The Committee is of the opinion that the use of hydrochloric and sulphuric acids is acceptable for the preservation of ensilaged fodders and also for improving the effectiveness of non-protein nitrogen compounds added to liquid molassed feedingstuffs intended for ruminants. The addition of these acids to other types of feedingstuffs is only acceptable if supported by the relevant documentary evidence.

REFERENCES

Grosz, 1974. Gärfutter, Ed. Eugen Ulmer, Stuttgart.