

REPORT OF THE SCIENTIFIC COMMITTEE FOR ANIMAL NUTRITION ON THE USE
OF CANTHAXANTHIN IN FEEDINGSTUFFS FOR SALMONS AND TROUT

Opinion expressed 14 December 1982

TERMS OF REFERENCE (November 1982)

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

1. Is canthaxanthin free of harmful effects when added to feedingstuffs for salmon and trout at a dose-level of 200 mg/kg complete feedingstuff?
2. Does the desired pigmentation of the flesh and skin of the fish necessitate the use of canthaxanthin doses up to 200 mg/kg complete feedingstuff throughout the rearing period?
3. Does the addition of canthaxanthin to feedingstuffs result in significant effects on salmon and trout breeding?

BACKGROUND

In accordance with the provisions of Council Directive 70/524/EEC, of 23 November 1970, concerning additives in feedingstuffs (1), as last amended by the 40th Commission Directive of 23 June 1982 (2), Member States are authorized to use canthaxanthin in feedingstuffs for poultry with a maximum content of 80 mg/kg complete feedingstuff and in dog and cat food.

(1) OJ No L 270, 14.12.1970, p. 1
(2) OJ No L 213, 21.07.1982, p. 22

It was proposed to extend the use of canthaxanthin to feedingstuffs for salmon and trout with a maximum content of 200 mg/kg complete feedingstuff.

The Scientific Committee for Food, consulted by the Commission on the safety of use of canthaxanthin in food, expressed a favorable opinion (Scientific Committee for Food, 1975). The acceptable daily intake for man, estimated by the Joint FAO/WHO Expert Committee on Food Additives, is 25 mg/kg b.w. (WHO, 1975).

OPINION OF THE COMMITTEE

1. Canthaxanthin (4,4'-diketo-B-carotene) belongs to the group of xanthophylls. It is naturally present in an edible mushroom (Cantharellus cinnabarinus), in various fishes (Clupea harengus, Coregonus lavaretus, Crinilabrus tinca, Eynniss japonica, Salmo iridens, Salmo gairdneri, Salmo trutta, Salmo salar, etc.) and shell-fish (Artemis salina, Daphnia magna, etc.), in some algae as well as in the plumage of some birds. Bauernfeind (1981) has published a comprehensive study on this pigment.

Canthaxanthin added to feed is well tolerated by salmonidae. No apparent harmful effects on behaviour and growth were observed in trout when fed for several months with feedingstuffs supplemented with 450 mg canthaxanthin/kg (Schmidt and Beker, quoted by Auger, 1973).

2. Various studies showed that pigmentation of trout already appears with the addition of 40 mg canthaxanthin/kg feedingstuff. In these con-

ditions, the flesh contains 75-136 micrograms canthaxanthin/100 g after 16 weeks. The fixing by the flesh in the rainbow trout is weak. According to Choubert and Luquet (1979, 1982), the absorption ranges from 5 to 40% depending on the conditions of use. Overpigmentation of the flesh is unlikely to occur.

Schmidt and Beker, quoted by Auger (1973), tested diets containing 190 to 450 mg canthaxanthin/kg feedingstuff for 7 to 31 weeks. The pink tinge of the flesh of the fishes was more sustained and slightly different from that of naturally pigmented fishes. This artificial pigmentation was more stable to heat.

Although there are no physiological, toxicological or organoleptic contra-indications to the proposed use of canthaxanthin in feeding-stuffs for salmonidae, the desired pigmentation may be obtained by feeding the trout during the last 3-4 weeks of the rearing period with a ration supplemented with 200 mg canthaxanthin/kg. For the salmon, the addition of 100 mg canthaxanthin/kg complete feedingstuff is sufficient, if the feeding is performed throughout the rearing period.

3. Canthaxanthin promotes the fertility in trout (Hartmann et Meden, 1947; Deufel, 1965, 1975). It has a vitamin A activity in this species (Bauernfeind, 1981).

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