



## Comments on dietary exposure studies on endosulfan in fish

### *Panel on animal feed, Norwegian Scientific Committee on Food Safety*

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Fish are highly sensitive to waterborne endosulfan exposure, and acute toxicity to fish has been reported in numerous studies. The toxicity of aquatic contaminants depends considerably on the route (water or feed) by which the animal is exposed. Until recently, little information existed on the sensitivity of fish to dietary exposure of endosulfan. The current EU maximum limit for endosulfan in fish feeds is set considerably lower compared to other animal feeds (5 versus 100  $\mu\text{g}/\text{kg}$ , Directive 202/32/EC). This limit reflects the naturally low levels of endosulfan found in marine fish feed components, the high acute waterborne toxicity of endosulfan to fish, and the relative lack of information regarding the toxicity of dietary endosulfan.

The Norwegian Scientific Committee of Food Safety, Panel on animal feed, wish to provide information regarding a recently published scientific peer-reviewed paper on Nile tilapia (*Oreochromis niloticus*) and results of an ongoing study in Atlantic salmon. One study that has previously been used to assess oral exposure in fish (Naveed et al. 2004, EFSA 2005) has been shown to be a waterborne exposure study (Naveed, personal information).

Two recent investigations have specifically examined the exposure of fish to endosulfan in the diet.

- 1) Coimbra and colleagues (2005) investigated the effects of 35 days exposure to 100 and 500  $\mu\text{g}/\text{kg}^{-1}$  endosulfan on thyroid hormone metabolism in tilapia (*Oreochromis niloticus*), Effects on thyroxine and deiodinase activities were observed at the 100  $\mu\text{g}/\text{kg}^{-1}$  exposure level.
- 2) Petri et al. (2005, NIFES unpublished data) investigated the sensitivity of Atlantic salmon (*Salmo salar*) exposed to dietary endosulfan for 49 days at levels of 4, 50, and 710  $\mu\text{g}/\text{kg}^{-1}$  assessed by haematology, blood biochemistry, and growth parameters. No mortality was observed and only fish exposed to the highest dietary concentration showed a transient response in haemoglobin and haematocrit and condition factor was reduced (see attached abstract), whereas no effects were observed in fish exposed to either 4 or 50  $\mu\text{g}/\text{kg}^{-1}$ .

The above mentioned studies only report on biological effects to the fish and do not reported on the carry-over of endosulfan from feed to the edible parts of the fish, such studies remain to be conducted, as highlighted by EFSA (2005).

## **Conclusion**

New investigations are available that can provide an additional basis for a risk assessment on the sensitivity of fish to dietary endosulfan.

## **ASSESSED BY**

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