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Organic fishery products – authentication by carotenoid analysis

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Due to the increasing demand and the higher price for organically produced fishery products, there is a potential risk of false declaration of conventional products as organic goods. The applicability of carotenoid analysis to the confirmation of correct labelling of shrimp and salmonid products even on the retail level was investigated.

Samples of salmon, brown trout, and shrimps, primarily *P. monodon* and *L. vannamei*, from several organic and conventional farms and from free-living stocks had been repeatedly bought on the German market. In all samples the content of astaxanthin and canthaxanthin as well as the ratio of the configurational isomers of free astaxanthin were analysed by HPLC.

In conventionally reared salmon the *meso*-form was always predominant, which indicated the use of synthetic astaxanthin in their feed. The conventionally farmed salmon could be clearly distinguished from wild salmon. In all products of wild salmon the SS-isomer outweighed the RR-isomer, but no *meso*-form of astaxanthin could be detected. On the other hand, the tissue of organic salmon showed a very inconsistent distribution of the isomers. When the feed was supplemented with the yeast *Phaffia rhodozyma* or the bacterium *Paracoccus carotinifaciens*, organic salmon differed significantly from conventionally farmed as well as from free-living salmon. But in the case of feeding a shrimp shell supplement, it was not possible to distinguish organically from conventionally farmed salmon. Moreover, in some organic samples distributions of isomers occurred, which could also be interpreted as wild salmon.

The ratio of configurational isomers of free astaxanthin in shrimp flesh was not suitable for their differentiation, because shrimps have obviously the ability to change the structure of carotenoids taken up from their feeding stuffs.

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