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Nonylphenol is not an Endocrine Disruptor

Nonylphenol (NP) is not an “endocrine disruptor” in mammalian species according to the broadly accepted Weybridge definition:

Weybridge 1996:

“An endocrine disrupter is an exogenous substance that causes adverse health effects in the intact organism, or its progeny, secondary to changes in endocrine function”.

“A potential endocrine disrupter is a substance that possesses properties that might be expected to lead to endocrine disruption in the intact organism”.

It is generally accepted that the endocrine activity of a substance can provide a mode of action that forms the basis for an effect to be evaluated, but not an independent “endpoint”. Endocrine activity can have an influence on various endpoints. The relevance of an endocrine activity to a particular endpoint (e.g. survival, growth, fertility), must be evaluated on the basis of all the available data using the weight of evidence.

Certain alkylphenols, including nonylphenol and octylphenol exhibit very weak hormone-like characteristics in laboratory experiments (in vitro- as well as in vivo-screening tests). As the EU risk assessment report for nonylphenol states “nonylphenol has oestrogenic activity of a potency that is between 3 and 6 orders of magnitude less than that of oestradiol [[the human female hormone]]”. Naturally occurring phyto-oestrogens are even more potent than nonylphenol in laboratory tests. Significant quantities of such phyto-oestrogens can be found in grains, fruits and vegetables (particularly in soya) and are part of our daily diet.

Various high quality “gold standard” multigeneration studies clearly show that nonylphenol does not cause adverse effects on reproduction in mammals. The EU risk assessment states: “...regarding the effects on the reproductive system, a NOAEL of 15 mg/kg/d has been established in a multigeneration study”.

Comparable results were also found in studies with related alkylphenols (e.g. p.-tert.-octylphenol).

In the EU risk assessment a daily intake of NP by consumers in the range of 150µg/day/person has been estimated. The estimated intake included the potential intake via the use of TNPP containing materials in food contact. The risk assessment clearly concluded that this low intake did not result in any risk to man.

Later on a publication by Guenther et al. (2002), where NP has been identified and quantified in food in Germany demonstrated that the actual intake was even below the estimated value of 150µg/d. The actual intake was estimated to be 20fold below that value. The comprehensive and realistic studies by Guenther et al. enabled a more detailed risk assessment, thereby strengthening the results of the risk assessment. Risks to consumers due to the use of NP do not occur.