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Stuttgart, July 22, 2015

— Your question regarding the potential absorption of polysorbate-80 micelles

Dear Mr. Behnam,

Thank you very much for enquiring about my opinion regarding the absorption of polysorbates from AQUANOVA micelles.

Absorption studies in humans and animals show that ingested or intravenously injected polysorbates are cleaved by endogenous enzymes into a free fatty acid and a polyoxyethylene sorbitan moiety. The released fatty acids are absorbed and metabolised identical to dietary fatty acids, whereas only a small fraction of the polyoxyethylene sorbitan moiety is taken up and the majority does not pass through the gastrointestinal barrier and is therefore excreted with the faeces. The small amount of polyoxyethylene sorbitan that is absorbed, however, is not retained in the body, but rapidly excreted with the urine.

Degradation of polysorbates by hydrolytic enzymes, however, requires access of the molecules to the catalytic centre of the enzyme. Free polysorbates are thus cleaved, while polysorbates that are part of a - relatively speaking - 'larger' micellar structure are spatially oriented in a way that probably prevents access of endogenous enzymes and thus cleavage into the polyoxyethylene sorbitan and fatty acid moieties.

— Further support for the safety of AQUANOVA Curcumin comes from a consensus statement of an expert panel that evaluated the safety of polysorbate 80 micelles containing coenzyme Q<sub>10</sub>. The expert panel came to the conclusion that no data exists to suggest any harmful effects of these coenzyme Q<sub>10</sub>-polysorbate 80 micelles and therefore declared them to be generally recognised as safe (GRAS).

Please also see the recent Scientific Opinion of the European Food Safety Authority (EFSA) that confirms the safety of polysorbates for human consumption at doses of 25 mg/kg bodyweight, which is based on the 100-fold higher (2.5 g/kg bodyweight) no-

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observed-adverse-effect-level (NOAEL) in rats (doi:10.2903/j.efsa.2015.4152).

The recently published Scientific Opinion of the EFSA can be accessed online at <http://www.efsa.europa.eu/en/efsajournal/pub/4152.htm>.

EFSA ANS Panel (EFSA Panel on Food Additives and Nutrient Sources Added to Food), 2015. Scientific Opinion on the re-evaluation of polyoxyethylene sorbitan monolaurate (E 432), polyoxyethylene sorbitan monooleate (E 433), polyoxyethylene sorbitan monopalmitate (E 434), polyoxyethylene sorbitan monostearate (E 435) and polyoxyethylene sorbitan tristearate (E436) as food additives. EFSA Journal 2015;13(7):4152, 74 pp. doi:10.2903/j.efsa.2015.4152

Based on the extensively documented safety of polysorbates and curcumin and our observations from human studies, I am convinced that AQUANOVA Curcumin is safe for human consumption.

Please do not hesitate to contact me, should you have further questions regarding the extremely low absorption of polysorbates or the safety of AQUANOVA Curcumin micelles.

Yours sincerely,

A handwritten signature in blue ink, appearing to be 'J. T. S.', written in a cursive style.