



Contamination of rice by mineral oil

Asian rice is frequently contaminated by mineral oil. There are at least two sources:

- Jute or sisal bags used by the producers for storage and transport
- Printing inks applied to the packaging

Both sources are unacceptable for the Swiss market.

Jute and sisal bags

Jute and sisal fibers must be treated by an oil (batching oil) before they can be spun. Conventionally a rather crude mineral oil has been used in amounts of several percent related to the fibers. The more volatile part of this oil evaporates and partially recondenses in the packed product, causing a substantial contamination.

Mineral oil consists of two types of hydrocarbons: the mineral oil saturated hydrocarbons (MOSH) and the mineral oil aromatic hydrocarbons (MOAH). Both types consist of thousands of substances. Part of the ingested MOSH remain in the body, as the human metabolism is unable to cope with it. Older individuals often contain more than 5 g such MOSH residues in their tissues. These high amounts may show effects on human health. Among the MOAH there are suspected carcinogenic substances.

In 2004, European Food Safety Authority (EFSA) published an opinion on the use of mineral oils in jute and sisal bags (EFSA Journal, 2004, 162, 1-6; <http://www.efsa.europa.eu/en/efsajournal/doc/162.pdf>), in 2012 one on mineral oil (Scientific Opinion on Mineral Oil Hydrocarbons in Food, EFSA Journal 2012;10(6):2704, <http://www.efsa.europa.eu/en/efsajournal/pub/2704.htm>), both confirming the views above.

Since 1999 only jute and sisal bags with batching oils of plant origin are accepted for products imported into Europe; for instance cocoa beans, coffee, nuts and oil seeds. Hence there is a substantial production of jute and sisal bags free of mineral oil which should be used for packaging and storing all foods.

Printing inks

Printing inks may contain low-viscosity mineral oil products as solvent. Such inks are illegal for food packaging as specifically regulated in Switzerland and soon also in Germany. Inks for food packaging (food grade inks) use esters usually based on fatty acids as solvent (<http://www.blv.admin.ch/themen/04678/04887/04891/index.html?lang=en>).

A potential problem seems to be the change from mineral-oil-containing inks used for applications other than food packaging to food grade inks, as there tends to be substantial carry-over if all the printing is done on the same system.