# Food safety for the food supply chain

## Klüber Lubrication support package

KLÜBER LUBRICATION

a brand of FREUDENBERG

# Content

# Recent MOSH & MOAH news

## Mineral oil in baby formula

### News:

EU-commission defined in Aug. 2020 an action-level for the assessment of MOAH in baby food.

Detection limit is 1 mg per MOAH-fraction per kg but still no legally binding limit value

### General information:

Foodwatch initiated independent analyses by official labs (CVUA) in Germany to determine amount of MOSH and MOAH in baby formula. 50 samples were tested.

- In **21% of all samples** MOAH was detected, which is more critical
- In **92% of all samples** MOSH was detected

# Food Safety

## MOSH and MOAH what is it?

### MOH - Mineral Oil Hydrocarbons

Mineral oils are complex mixtures of hydrocarbons, derived from crude oil. They consist of two fractions:

### MOSH - Mineral Oil Saturated Hydrocarbons [2,3]

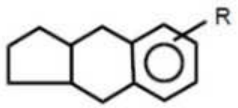
Paraffin-like, open-chained, commonly branched hydrocarbons (e.g. alkanes) and naphthene-like cyclic hydrocarbons (cycloalkanes)

Example for a branched hydrocarbon:

### MOAH - Mineral Oil Aromatic Hydrocarbons

Mainly consisting of highly alkylated mono- and/or poly-aromatic rings

Example for an aromatic system:




The following groups are so-called **MOSH-analogues:**

### PAO - Poly-Alpha Olefins

Components in synthetic lubricants and hot melt adhesives that may migrate into food. Difficult to differentiate analytically from MOSH.

### POSH - Polymer Oligomeric Saturated Hydrocarbons

Oligomers of the plastics polyethylene or polyprobylene. Chemically similar to MOSH and cannot be separated analytically.

! There are **no products** that are completely **MOSH/MOAH free and contain 0%** of MOAH/MOAH.

How do you **know for sure** that a product is **MOSH/MOAH** free when someone claims it?



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# Effects on human health

Important to distinguish between **MOSH** and **MOAH** in mineral oils as they have **different harmful effects**.

## MOSH

The human body can intake MOSH which can be detected in certain organs but the relevance for the human body is not clear yet.

## MOAH

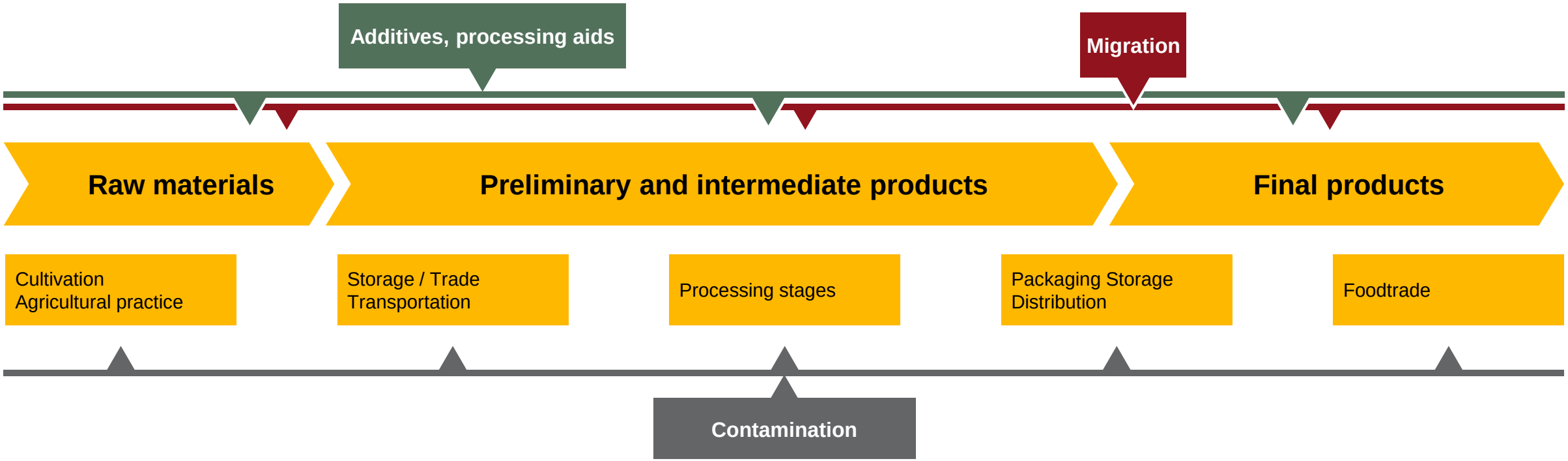
Some of these substances can cause cancer. It is however not possible to specify whether the daily intake of these substances is too high, as there is no existing health-based guidance value for MOAH.

## POSH

It has to date not been possible to conduct a health assessment of these substances.

# Where does MOSH/MOAH come from?

**For food manufacturer**




Systematic illustration of the routes of entry of MOSH/MOSH analogues and MOAH into food

# Where does MOSH/MOAH come from?

A few examples

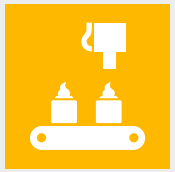
**Contaminations from the environment and machines**

**Insecticides**

**Release agents, defoamer, anti-dust agents, …**

**Packaging**

**Drying processes**



**Food processing**

**Metalworking agents during can production**

**Fraud and misconduct**

# Risk reduction in your production

**Raw materials**

**Food Manufacture**

**Packaging**

# Best practice on lubrication management – MOSH/MOAH

3 key actions to support compliance

**1** **Risk assessment** on applications with greatest risk of MOH contamination

**2** **Review lubricant** used under 1. where greatest risk was identified to select a lubricant that will **eliminate the risk**

**In case 2 is not possible**

**3** Where it is not possible to select a lubricant to eliminate risk under 2. continue with:

- Review of the lubricant selection to **reduce volume** of lubricant used to minimise the risk
- Review of the component to identify possible changes with for example sealing and lubricant selection to **reduce wear**
- **Mechnical design changes**, e.g. drip trays to stop lubricant dripping on to the food product

# Case study

## Cocoa Manufacturing in Malaysia

Cocoa manufacturer received **MOSH/MOAH compliance requirement** from their customer, given a **timeframe until end of 2020.**

**Limited understanding towards MOSH/MOAH topics**, manufacturer was not sure how they could fulfill their customer's request. Other lubricant suppliers provided unclear/unconvincing explanations.

Klüber Lubrication Malaysia helped to understand the **potential channels and root cause of MOSH & MOAH contamination.**

Manufacturer implemented an **effective plan to minimize the risk of contamination.**

# Case study

## Cocoa Manufacturing in Malaysia

**01** **Virtual training and discussion** on MOSH & MOAH topics to top management team and other stakeholders.

**02** Obtained the **equipment list** with information included types of applications and current lubricants in used.


**03** Declare the MOSH & MOAH **ingredient information** in our food grade lubricants.

**04** Package **KlüberMonitor, KlüberMaintain, KlüberCollege, KlüberEnergy** as value added tools to support achieving compliance target and optimization.

**05** Provide **on-site consultation** to customer when they commence the lubricant changeover.

# Advantages of well formulated lubricants

**Your goal is to ensure food safety in your production at all times**

**Contaminations should be avoided by keeping the lubricant out of the food product**

Formulation of lubricant (additives!) is key to secure ideal performance when applied correctly e.g to reduce the risk of gear box or hydraulic unit seal damage and risk of leakage and food contamination
– smart use of lubricants

**Example:**
Adhesive chain oil (Klüberfood NH1 CX 4-220) to avoid drip-off and with good antiwear behaviour for longer chain life. Excellence properties achieved by additives in formulation that contains small amounts of MOSH/MOAH

So called MOSH/MOAH ”free“ lubricants can potentially result in contamination!

Important to consider selection of a carefully formulated product to ensure food safety in your production!

# How to get started on the journey of food safety and optimisation

**Complete evaluation form / checklist**

**Kick off meeting**

**Agree on scope, objective, outline on resources and tools**

Pushing the limits **together!**
We support you being compliant with **your standards!**