

Questions&Answers

PAPER VALUE CHAIN

Questions and answers on the migration of mineral oils from packaging materials to foodstuffs

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These questions and answers are addressed to the non-technical experts in the paper-based packaging value chain with some familiarity in food safety issues. Answers are constantly updated where new information is found.

1. What is the context of minerals oils in cartonboard food packaging?

Investigations have found mineral oils in certain foodstuffs which have been packed in paper and board packaging applications. Mineral oils are present in the environment, therefore also in food. The traces found in this investigation originate from mineral oil-based printing inks and chemicals and have migrated into the food.

Recycling is needed for sustainability: 69% (2010) of paper consumed in Europe is recycled, resulting in significant savings of water, energy and material resources. It is important to continue recycling. The paper industry recognises the risk of public confidence in recycling and the use of recycled content being undermined by this issue and is assessing what opportunities we have to further promote the undoubted benefits of both.

2. How do mineral oils get into the food?

According to recent studies, traces of mineral oils in the food were caused by printing inks on the packaging and/or by recycled fibres from printed papers, mainly from newspapers, and process chemicals used for the production of the food packaging.

Mineral oils can also be used in production of food.

3. Are all foods concerned?

Up till now, data on the migration of mineral oils from packaging material into various foodstuffs is rare. Further investigations are taking place. The German risk assessment authority (BfR) assumes that especially dry foods with a large surface area are expected to be affected by mineral oils migration from packaging.

4. Is the migration of mineral oils into foodstuff harmful for the consumer?

There are concerns about the migration of mineral oils into foodstuffs, however, up to now no scientific evidence of concrete damage has been found. The British Food Standards Agency (FSA) has recently stated (9 March 2011) that it is not aware of any firm evidence to suggest food safety risks related to mineral oils in recycled food packaging. This position is supported by a FSA study (2003) on the migration of mineral oils from food packaging into food and a new assessment by FSA confirming this is expected by end of 2011. The German research is interesting, but due to incomplete data the results have not demonstrated that mineral oils in food packaging represent a food safety risk. The 2003 FSA study concluded: "Migration of mineral hydrocarbons into food is not a health concern. Consumer intakes of wax and oils migrating into food were within ranges of Acceptable Daily Intakes set by the European Union's Scientific Committee for Food and Joint FAO/WHO Expert Committee on Food Additives." The health and safety of consumers is the number one priority for the industry and that is why the paper-based packaging industries are taking the recently raised concerns about mineral oils in foodstuffs very seriously and doing everything in their control to address these concerns.

[See also Q6: Are there safety limits for mineral oils?]

5. Do all mineral oils pose a risk for the consumer?

There are various grades of mineral oils: The U.S. Food and Drug Administration (FDA) has established that mineral oils that meet detailed purity specifications are acceptable for use in both food and food

packaging applications. Therefore, in the United States mineral oils can be applied directly to foods, provided that impurities are minimized. The World Health Organization standards also permit mineral oils to be used in food processing. Mineral oils are also commonly used in pharmaceutical applications. Based on this, it may not be necessary to stop using such highly refined grades of mineral oils (often referred to as white mineral oils), however, the recently developed detection methods do not distinguish between the various qualities of mineral oils, in other words, do not detect presence or absence of risk. CEPI and CITPA have commissioned biological testing on the mineral oils actually used in printing inks: no toxic effects were detected. Similar conclusions could be drawn from a literature review of past studies on mineral oils, in line also with results reported by other recent testing by Shell and the EU trade association of mineral oil suppliers (CONCAWE),

6. Are safety limits being set for mineral oils?

The safety limits for mineral oils depend on the context where they were set: occupational health and safety, European chemicals regulation REACH or food safety – all of which have very different safety considerations.

As the assessment by European Food Safety Authority (EFSA) is still pending, the currently available science suggests¹ an acceptable level of mineral oils migration at the level of 0.6 mg/kg. To put this safety limit in perspective, this amount equals to a concentration of 0,000006% and corresponds to a proportion of one sugar cube in 6 000 litres or 25 316 cups of coffee drunk by one person per day.

The German federal risk assessment authority (BfR), the European Food Safety Authority (EFSA) and many companies in the food packaging value chain are currently investigating the situation. The EFSA opinion is expected in September 2011. [See also Q4 and Q5.]

Some companies are setting indicative targets for their own production (e.g. 100 mg/kg in the packaging material). Such target levels are not based on safety evaluations and serve only to inform customers about the current performance of those mills.

7. How can the problem be solved? What actions have the industry taken?

The paper-based packaging chain has a “dual track” approach: we aim to phase-out mineral oils in all paper applications in the mid-term and, in parallel, work on short-term solutions to reduce migration of mineral oils to food.

Several parallel actions are being taken throughout the value chain: in Germany, a joint group of ink manufacturers, printers, publishers and paper industry is in the search of mineral oil –free printing inks for newspapers. The paper and board manufacturers are phasing out mineral oil-containing process chemicals and, wherever possible, use recovered paper types with minimal mineral oils-content. Packaging producers are switching to use only mineral oil-free inks for printing their packaging. A measurable commitment by the relevant sectors will be launched (late 2011) to meet a safe level of mineral oils in food.

New technical solutions are being researched and found but it will take time before they are technically and commercially available for packaging applications. This is necessary to ensure that the solution does not solve one problem and create another one. In particular the packaging has to perform well in protecting food and avoiding food waste and to be easy to recycle.

8. How can the problem be solved? What role can regulation and standards play?

The German government is preparing national controls on printing inks used in food packaging to prevent health risks to consumers. A regulation is being drafted by the consumer protection ministry (BMELV). The paper packaging value chain is in active dialogue with national and European food safety authorities as well as with other key stakeholders such as ink producers and publishers. It is essential that all parties take their responsibility to avoid, wherever possible, the entry of substances affecting the recycling system.

Many safety measures are already in place along the value chain which are used in quality and risk management. The European paper-based packaging industry has been a pioneer in developing and setting peer reviewed standards² for food contact production and measures to ensure that standards are met. Together they form a quality management system to avoid any incidents and to take corrective

¹ *Acceptable Daily Intake set by the European Union's Scientific Committee for Food and Joint FAO/WHO Expert Committee on Food Additives.*

² *Industry Guideline for the Compliance of Paper and Board Materials and Articles for Food Contact by CEPI and CITPA, 2010, and Good Manufacturing Practice for the Manufacture of Paper and Board for Food Contact by CEPI, 2010.*

measures as science develops. This approach is considered to be best practice by authorities and will continue to be applied when designing packaging in its entirety. Those standards exist in written form, have been presented to European and national authorities and are made publicly available.

9. Why does the industry not just stop using mineral oil-based inks for printing as these are currently available? Presumably this is a matter of cost?

In the packaging sector, the action has already been taken despite the increased cost of using mineral oil –free printing inks.

In the graphic paper sector, cost is a factor but the primary challenge in replacing mineral oil-based inks is technological: a joint group across the sectors has been set up in Germany to find mineral oil –free printing inks for newspapers. [See Q7.]

10. Why doesn't the packaging industry just use plastic?

There is a wide range of packaging solutions for different applications. Plastic packaging, on the other hand, has some other issues concerning consumer safety and its sustainability.

Paper and board consists predominantly (>99%) of cellulose fibres, naturally occurring minerals such as calcium carbonate, and natural polymers such as starch. The paper industry has a long tradition of resource efficiency and applying eco-design principles to use only approved and safe substances and raw materials; the same principles should be used when applying inks and adhesives on paper.

Using paper based packaging produces massive advantages in terms of functionality (protecting the food), cost and sustainability, and the industry is very confident in its ability to address the concerns that exist around the use of mineral oils.

11. How long have you known about this problem?

The British Food Standards Agency (FSA) made studies in 2003 and did not find any firm evidence to suggest that there are food safety risks related to mineral oils in recycled food packaging. Also the US food safety authorities (FDA) have authorized the use of mineral oils both in the food packaging and in the food. As of precaution, certain tests related to this problem were made in Europe, but it was only after recent studies that the industry and the authorities were made aware about possible new concerns about the migration of mineral oils into foodstuffs.

12. Is the use of recycled paper for the packaging of foodstuffs a responsible choice?

Yes it is. The use of recycled fibres for food packaging was accepted by the recommendation XXXVI of the German Federal Institute for Risk Assessment (BfR) as well as by other national legislation and the Council of Europe Resolution (2002).

The German Environmental Agency (UBA) has stated that the resolution of the current mineral oils issue should not stop nor decrease paper recycling. The agency points out some possible solutions including that the publishers and the printers switch to alternative printing inks. Likewise, the British Waste resource action programme (WRAP) recognises the risk of public confidence in recycling and the use of recycled content being undermined by this issue and are assessing opportunities to further promote the undoubted benefits of both.

This situation must not endanger paper recycling, because it is the base of a sustainable and environmentally responsible packaging industry as well as a resource efficient economy. The paper value chain will ensure that recycled paper continues to be used in food packaging while securing consumer safety.

13. Would the issue be solved by using virgin fibres alone?

Packaging based on virgin fibres is a good contribution to minimisation of mineral oils in food, in addition to phasing out mineral oils in process chemicals and packaging printing inks. However, without a systemic solution even virgin packaging free of mineral oils would be exposed to mineral oils during logistic operations.

Paper-based packaging is currently using recycled fibre in 75.3% of production. This corresponds to 31 million tonnes of recovered paper per annum and the amount is growing. In comparison, the yearly virgin pulp consumption in the total European paper and board production is 46 million tonnes. Substitution of recovered paper in packaging with virgin pulp would mean an increase of 67% in the

European pulp consumption. Such increases would not be possible in terms of capacity and sustainability.

14. Would the issue be solved by using functional barriers?

Some companies have been developing barrier solutions but they are not yet commercially available. There are some key aspects to be further investigated such as the compatibility of barriers with some types of food and its recyclability.

15. Does the German government have an authority to issue a regulation on mineral oils?

The European Framework Regulation 1935/2004 gives the member states the mandate to regulate on materials where no European specific regulations exist. Therefore, the German government has the possibility to issue legislation for Germany concerning paper-based packaging and mineral oil-concentration in food. A draft regulation was published on 2 May 2011 for consultation at the stakeholders. A second draft is expected by early 2012.

16. What is the analytical method suggested in the German draft regulation?

The draft does not specify any analytical method. This actually is one of the major concerns for the enforceability of the regulation as for the time being the test originally developed by Dr Grob has been repeated by other researchers with significant variation in the results. Measuring compliance of the very low levels of MOSH set in the draft regulation without a sound, accurate and precise, repeatable and reproducible test seems a major obstacle in applying the regulation in practice.

17. What are the implications for the industry?

The industry cannot comply with the indicated levels, leading to enormous consequences to the paper-based packaging value chain. In the context of overall risk and the potential overall cost of complying with the regulation it seems the draft regulation is not proportionate. We are putting efforts to solve this problem, but the solution at the root cause is to change the formulation of printing inks. In addition, failing to use printed paper as input material for recycling for paper packaging would imply a collapse of the paper recycling loop in Europe.

18. What is the industry going to do about it?

The industry will continue to investigate solutions to reach the indicated levels of mineral oil. However, it will take time, as will take time the implementation of new solutions. We must sit down with the legislators and all the other involved stakeholders, both at European and National level, to agree on intermediary voluntary solutions.
