foodwatch

Test **2015**

MINERAL OIL IN FOOD –
Results of the foodwatch test

MINERAL OIL IN FOOD – RESULTS OF THE FOODWATCH TEST

In a recent foodwatch test, 120 cardboard-packaged food products from three European countries (Germany, France and the Netherlands) were analysed for mineral oil content. The results: 43% of the products tested were found to be contaminated with potentially carcinogenic and mutagenic mineral oil components, most of which had migrated from recycled packaging materials.

ABOUT THIS PUBLICATION

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TABLE OF CONTENTS

1. INTRODUCTION

The issues associated with harmful mineral oils in food have been known for years – particularly the fact that packaging made from recycled materials is one of the primary sources of this contamination. The use of recycled paper, although beneficial to the environment, poses significant health risks, because practically everything that is thrown into the recycling bin ends up in the packaging and can then migrate into our food.

These contaminants consist primarily of mineral oils from printing inks, but can also include smaller quantities of other potentially harmful substances, such as endocrine-disrupting plasticisers and solvents. As early as 2012 a study conducted by the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV, now BMEL) led to the unambiguous conclusion that the only effective means of safeguarding food (and thereby consumers) from mineral oils and other chemicals is the use of protective barriers in food packaging. However, neither Germany nor the EU has responded to this issue with legislation designed to protect consumers.

This fact led foodwatch to ask the following questions: To what extent are our foods currently contaminated with mineral oil? And: are there national differences in contamination levels? To answer these questions, foodwatch conducted the most extensive international test of mineral oil contamination to date: 120 food products packaged in cardboard were analysed for mineral oil content.

2. HOW DOES MINERAL OIL GET INTO FOOD?

From packaging materials
Mineral oil from recycled cardboard packaging can transfer to the packaged food either through direct contact or via the gas phase, i.e. through so-called migration. Even food products packaged in virgin cardboard are at risk because mineral oil components can migrate through the "clean" food packaging from outer packaging materials made from recycled paper (e.g. corrugated cardboard boxes).

Other sources of contamination
Foods can also become contaminated with mineral oil further upstream in the production process. Not only is mineral oil always present in the environment at certain background concentrations (unavoidable); the food industry uses them legally for various applications, e.g. as lubricants for production equipment, as dust binders and adhesives as well as release agents.

3. HEALTH RISKS

The mineral oil components found in food can be grouped into two categories:

- **Mineral oil aromatic hydrocarbons (MOAH),** geare suspected of having carcinogenic, mutagenic and endocrine-disrupting properties.The European Food Safety Authority (EFSA) has determined that any exposure aromatic mineral oils through food is of potential concern. The German Federal Institute for Risk Assessment (BfR) is also of the opinion that no contamination of food with aromatic mineral oils should occur.

  In the analysis of our test results, food products with any detectable concentration of MOAH were therefore considered to be contaminated to an unacceptable level.

- As food contaminants, **mineral oil saturated hydrocarbons (MOSH)** are found much more frequently and in much higher concentrations. These substances accumulate in the body and can cause damage in several organs. On average, our bodies contain around one gram of mineral oil– which means that, from a quantitative standpoint, mineral oil represents the largest contaminant in the human body. No acceptable daily intake levels have been officially established for MOSH because no conclusive toxicological assessment is currently available.

  Therefore, on the basis of our test results, we developed our own assessment scheme for saturated mineral oils (MOSH) in accordance with the principle "the lower the contamination, the better."

4. PRODUCT SELECTION AND TEST METHOD

Focus on dry food products with a long shelf life

Owing to the fact that the migration of mineral oil depends in part on the consistency of the food and the length of time it spends in the package, our study focused on dry foods with a long shelf life, for which migration levels are typically the highest. We tested products packaged in cardboard with and without inner bags because studies have shown that only some materials are able to effectively slow or stop the migration process.

Selection of product categories

In all countries, we chose food products that (1) are consumed frequently and in large quantities and (2) have been found to contain mineral-oil contaminants in past studies: rice, pasta and cornflakes. In addition, we tested one or two specific products that are particularly popular in each of the three countries (Germany: soft wheat semolina; France: couscous and lentils; Netherlands: chocolate sprinkles). Both name brands and store brands were randomly selected for each product category. Finally, twenty-five additional products of various types were tested under the category "other" in order to get an overview, at least on a random-sampling basis, of the contamination situation for other foodstuffs.

Test methods

The products tested were purchased in all three countries within a one-week period at the end of June 2015. The mineral oil content for each product was determined by on-line HPLC-GC-FID in accordance with the German Federal Institute for Risk Assessment (BfR) compendium on the determination of mineral oil hydrocarbons in food and packaging materials ("Messung von Mineralöl-Kohlenwasserstoffen in Lebensmitteln und Verpackungsmaterialien"). All tests were performed in July 2015 by a laboratory accredited to DIN EN ISO 17025.

5. SUMMARY AND INTERPRETATION OF RESULTS

The majority of the products tested were found to be contaminated with mineral oil. In total, 100 of the 120 products tested (83%) were found to be contaminated with saturated mineral oils (MOSH), and 52 of the 120 products tested (43%) contained potentially carcinogenic mineral oil aromatic mineral oils (MOAH).

The test results indicate that **packaging is the main source of contamination**. However, there were also products whose contamination appeared to have come partly from lubricants, release agents and/or environmental pollution. No clear conclusions regarding the source of contamination can be drawn because the products would have to be tested at several different stages of production.

An interesting finding was that several of the food products contained aromatic mineral oils (MOAH) in spite of the fact that no trace of MOAH could be found in the cardboard packaging, meaning that it had apparently been made from virgin pulp. According to the laboratory's analysis, these contaminants had most likely **migrated from the outer packaging**, for example from the corrugated cardboard boxes often used for transport and storage.

Finally, the test results also show that some manufacturers – particularly the tested German brands of cornflakes – are **apparently already using effective barriers in their recycled paper packaging** that prevent the migration of mineral oil into foodstuffs. This assumption is reasonable in cases where the food packaging is found to have a high mineral-oil content, but the packaged foodstuff shows low contamination levels that do not increase over time.

Important note: this test is only a **snapshot**. Owing to the fact that migration is a time-dependent process and the products that we tested had only been stored for a short period of time, it cannot be ruled out that the contamination levels of some products with no effective barrier could have increased in the future after a longer period of storage.

International comparison
MOSH and MOAH were present much more often and in much higher concentrations in the products that were purchased in France and the Netherlands than in the German products.

It would appear that several German manufacturers have either switched their packaging to virgin cardboard or added effective barriers in their recycled cardboard. These changes may have been prompted by the long-discussed German "Mineral Oil Ordinance" ("Mineralölverordnung") aimed at reducing the migration of mineral oil into foods or by the public debate that took place over the discovery of mineral oil in German advent calendars (Stiftung Warentest 12/2012).

6. FOODWATCH'S DEMANDS

The test results, particularly those for several German manufacturers, show that the problem of mineral oil contamination in food is absolutely solvable. In order to ensure that consumers will be effectively and comprehensively protected from health risks of this kind in the future, foodwatch is demanding that the following measures be taken:

1.) **Functional barriers must be mandatory for all paper packaging. In the case of recycled paper:** regulations that only apply to mineral oils are grossly inadequate, because a large number of other potentially harmful substances present in recycled paper can also migrate into foodstuffs. The above-mentioned BMELV study came to the clearly formulated conclusion that the only effective means of protecting foodstuffs from the hazardous substances found in packaging materials is the use of a suitable barrier (which can be a separate inner bag or also a barrier/absorber integrated into the cardboard packaging).

Even if the food packaging is made from virgin paper or cardboard, manufacturers must also use an effective barrier in the food packaging or outer packaging materials to protect foodstuffs from harmful substances during transport and storage.

Exceptions to the mandatory barrier requirement may only be granted if the manufacturer can prove that, owing to the characteristics of the foodstuff or the special storage conditions, no migration can occur.

2.) **Specific limits must be established for concentrations of MOSH/MOAH in food:** Any regulation that applies only to the recycled papers and cardboards used in contact with food has no influence on food contamination with mineral oils that occurs in other stages of production. This contamination can only be prevented if specific limits are established for mineral oils in food and if compliance with these limits is effectively enforced.

MOAH due to its carcinogenic and mutagenic potential must not be detectable at all by state of the art lab analysis.

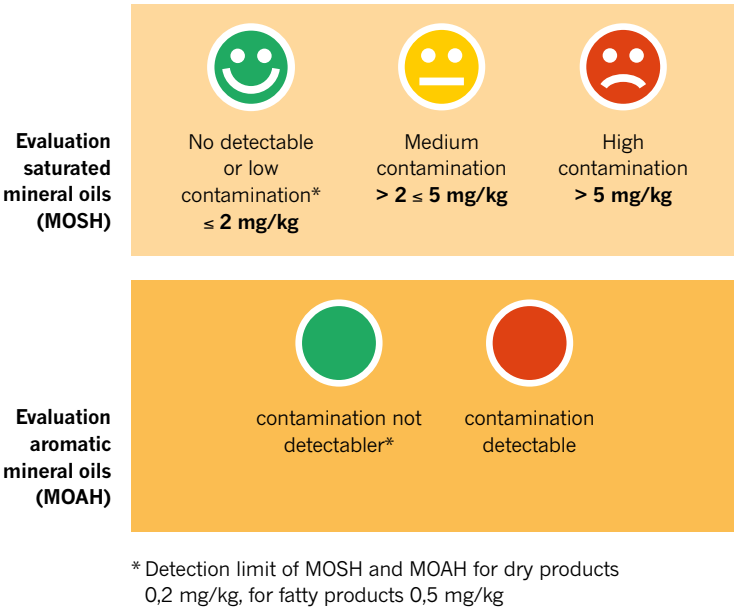
In order to protect consumers' health, the above-listed demands must be transposed into European law. Until a European law has passed, national governments need to take action.

7. TEST RESULTS

This is how we evaluated

Aromatic mineral oils (MOAH) are suspected of having carcinogenic, mutagenic and endocrine-disrupting properties. In the analysis of our test results, food products with any detectable concentration of MOAH were therefore considered to be contaminated to an unacceptable level (and marked red).

Saturated mineral oils (MOSH) accumulate in the body and can cause damage in several organs. No acceptable daily intake levels have been officially established for MOSH because no conclusive toxicological assessment is currently available. Therefore, on the basis of (the range of) our test results, we developed our own assessment scheme for MOSH in accordance with the principle "the lower the contamination, the better."



* Detection limit of MOSH and MOAH for dry products 0,2 mg/kg, for fatty products 0,5 mg/kg

D

RICE

	Uncle Ben's Loser Reis Spitzen-Langkorn-Reis	reis-fit Spitzen-Langkorn	Curtiriso Natur Langkorn Parboiled Reis	Müller's Mühle Minuten Spitzen Lang-korn Reis	Wurzener Langkorn Reis	Rewe Bio Spitzen-Langkornreis (Rewe)	Bon-Ri Kochbeutel Reis Spitzen-Lang-korn (Aldi Nord)	Gut & Günstig Langkorn Spitzen Reis (Edeka)
Best-before date	29/09/2017	10/03/2017	28/07/2016	22/09/2016	28/04/2017	12/05/2017	10/10/2017	18/09/2017
Packaging material**	Fresh fibre	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING								
Saturated mineral oils (MOSH) in mg/kg	9,3	91,2	220	46,1	16,9	17,5	20,1	16
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	78	<5	<5	<5	<5	<5
IN THE FOOD								
Saturated mineral oils (MOSH) in mg/kg	0,9	3,8	2,3	0,9	1,7	0,3	0,8	0,6
Aromatic mineral oils (MOAH) in mg/kg	not detectable	0,6	0,7	0,3	not detectable	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

D

PASTA

	Barilla Spaghetti n.5	Alnatura Lasagne	Edeka Italia Lasagne N.61 (Edeka)	K-Classic Lasagne (Kaufland)	Rewe Beste Wahl Lasagne (Rewe)	San Fabio Lasagne (Penny)	Combino Tortiglioni (Lidl)	real Quality Spaghetti (Real)
Best-before date	01/11/2017	19/04/2018	13/02/2018	02/04/2018	25/04/2018	05/2018	14/04/2017	03/03/2018
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING								
Saturated mineral oils (MOSH) in mg/kg	48,8	134	92	110	66,8	83	19,3	28,7
Aromatic mineral oils (MOAH) in mg/kg	<5	12	10	<5	<5	<5	<5	<5
IN THE FOOD								
Saturated mineral oils (MOSH) in mg/kg	0,2	not detectable	not detectable	not detectable	1,5	1,2	3,0	1,7
Aromatic mineral oils (MOAH) in mg/kg	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

D

SEMOLINA

	Aurora Weichweizen Grieß	Diamant Weichweizen Grieß	Weltgold Weichweizen Grieß	Korn Mühle Weichweizen-Grieß (Netto)	Rewe Bio Weich-weizengrieß (Rewe)	Penny Weichweizen Grieß (Penny)	Gut & Günstig Weichweizen Grieß (Edeka)	Mühlengold Weichweizen-Grieß (Aldi Süd)
Best-before date	03/04/2016	20/09/2016	11/2016	10/2016	30/04/2016	11/2016	11/2016	18/08/2016
Packaging material**	Fresh fibre	Recycled fibre	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre	Recycled fibre	Fresh fibre
IN THE PACKAGING								
Saturated mineral oils (MOSH) in mg/kg	38,3	537	37	440	42	61	402	16
Aromatic mineral oils (MOAH) in mg/kg	<5	144	<5	101	<5	<5	92	<5
IN THE FOOD								
Saturated mineral oils (MOSH) in mg/kg	0,4	0,4	0,5	0,6	1,3	0,4	0,5	0,4
Aromatic mineral oils (MOAH) in mg/kg	not detectable	not detectable	not detectable	0,2	0,3	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

D

CORNFLAKES

	Kellogg's Cornflakes	BioBio Cornflakes (Netto)	Crownfield Cornflakes (Lidl)	ja! Cornflakes (Rewe)	K Classic Cornflakes (Kaufland)	Knusperone Cornflakes (Aldi Süd)	Kornmühle Cornflakes (Netto)	Tip Cornflakes (Real)
Best-before date	09/04/2016	01/03/2016	04/05/2016	06/05/2016	11/03/2016	25/05/2016	22/04/2016	03/04/2016
Packaging material**	Recycled fibre	Recycled fibre	Fresh fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre
IN THE PACKAGING								
Saturated mineral oils (MOSH) in mg/kg	249	355	8	350	376	193	417	427
Aromatic mineral oils (MOAH) in mg/kg	53	130	<5	99	110	53	117	145
IN THE FOOD								
Saturated mineral oils (MOSH) in mg/kg	2,0	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable	0,6
Aromatic mineral oils (MOAH) in mg/kg	0,3	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

D

OTHERS

	Jonas Rote Linsen	Baktat Couscous	Leimer Paniermehl	Hahne Haferflocken	Kathi Zitronen Kuchen Backmischung	Mondamin Feine Speisestärke	Bensdorp Kakao
Best-before date	2017	22/04/2017	27/07/2016	09/04/2016	28/07/2016	05/2018	08/04/2018
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	13	30,8	29,6	81,4	517	47,6	30,8
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	<5	<5	95	<5	<5
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	1,3	not detectable	1,6	3,2	1,8	1,7	0,8
Aromatic mineral oils (MOAH) in mg/kg	0,4	not detectable	not detectable	0,4	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

D

OTHERS

	Ruf Raspel Schokolade Zartbitter	Sweet Family Puder Zucker	Dr. Oetker Original Pudding Vanille Geschmack
Best-before date	10/2016	–	10/2016
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING			
Saturated mineral oils (MOSH) in mg/kg	469	19	106
Aromatic mineral oils (MOAH) in mg/kg	145	<5	<5
IN THE FOOD			
Saturated mineral oils (MOSH) in mg/kg	not detectable	3,4	3,1
Aromatic mineral oils (MOAH) in mg/kg	not detectable	0,5	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

NL

RICE

	Uncle Ben's Langkorrelrijst	Lassie Toverrijst	AH Pandan rijst (Albert Heijn)	AH Puur&Eerlijk biologische witte rijst (Albert Heijn)	Jumbo Zilvervliesrijst (Jumbo)	Sawa Snelkookrijst (Aldi)	Golden Sun Witte Snelkook-rijst droge korrel (Lidl)
Best-before date	07/09/2017	05/2017	27/05/2017	15/05/2016	04/2016	04/06/2017	06/05/2017
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	6,4	34	33,6	37,2	37,7	8,9	8,4
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	<5	<5	<5	<5	<5
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	2,4	0,9	0,6	1,0	3,0	0,4	0,9
Aromatic mineral oils (MOAH) in mg/kg	0,3	not detectable	not detectable	0,3	0,8	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

NL

PASTA

	De Cecco Spaghetti Bio	Honig Dora Pasta	Grand'Italia Lasagne	AH Lasagnebladen (Albert Heijn)	Jumbo Spaghetti (Jumbo)	D'Antelli Tagliolini (Aldi)	Combino Tagliatelle (Lidl)
Best-before date	14/03/2017	04/2017	20/02/2018	20/04/2018	04/2018	20/04/2017	09/05/2017
Packaging material**	Fresh fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Fresh fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	51	442,2	1008	561	698	760	12
Aromatic mineral oils (MOAH) in mg/kg	<5	63	213	67	74	114	<5
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	not detectable	12,4	3,6	13,4	133	27,5	3,6
Aromatic mineral oils (MOAH) in mg/kg	not detectable	0,3	0,6	1,2	0,6	5,0	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

NL

CORNFLAKES

	Kellogg's Corn Flakes	Hahne Corn Flakes	Allos Amaranth Corn Flakes Bio	AH Corn Flakes (Albert Heijn)	AH Basic Corn Flakes (Albert Heijn)	Jumbo Corn Flakes (Jumbo)	Crownfield Corn Flakes (Lidl)
Best-before date	16/04/2016	16/05/2016	27/10/2015	11/05/2016	29/06/2016	12/06/2016	28/04/2016
Packaging material**	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Fresh fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	188	373	343	428	252	196	17,9
Aromatic mineral oils (MOAH) in mg/kg	31	105	77	122	66	58	<5
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	0,6	0,4	5,1	1,3	0,5	0,4	not detectable
Aromatic mineral oils (MOAH) in mg/kg	not detectable	not detectable	1,2	0,4	0,2	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

NL

CHOCOLATE SPRINKLES	De Ruijter Puur Chocoladehagel	De Rit Chocoreale Dark Bio	K3 Hagelslag	AH Basic Sprinkles Plain Chocolate (Albert Heijn)	Kiekeboe Pure Chocolade Hagelslag (Aldi)	Mister Choc Twinkelz Hagelslag Melk (Lidl)	Jumbo Hagelslag Puur (Jumbo)
Best-before date	06/2016	10/05/2016	07/2016	05/2016	06/07/2016	10/2015	05/2016
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre	Fresh fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	98,8	34,5	<5	10	19	7,5	17,1
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	<5	<5	<5	<5	<5
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	2,3	3,0	0,8	1,4	5,2	4,5	0,8
Aromatic mineral oils (MOAH) in mg/kg	not detectable	0,7	not detectable	not detectable	not detectable	0,8	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

NL

OTHERS








	Quaker Havermout	Koopmans Maizena	Haust Beschuit paneermeel	Brinta Graanontbijt	De Ruijter Vruchtenhagel	Droste Cacao	AH Couscous (Albert Heijn)	AH Griesmeel (Albert Heijn)
Best-before date	30/04/2016	10/02/2018	07/12/2015	05/2016	05/2016	11/03/2018	23/05/2017	04/2017
Packaging material**	Fresh fibre	Recycled fibre	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre	Recycled fibre	Fresh fibre
IN THE PACKAGING								
Saturated mineral oils (MOSH) in mg/kg	5,5	387	16	371	70	7	483	26,9
Aromatic mineral oils (MOAH) in mg/kg	<5	104	<5	111	<5	<5	77	<5
IN THE FOOD								
Saturated mineral oils (MOSH) in mg/kg	0,8	12,6	2,3	6,1	not detectable	9,4	3,0	1,6
Aromatic mineral oils (MOAH) in mg/kg	not detectable	1,9	not detectable	1,2	not detectable	0,7	0,7	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

F

RICE

	Uncle Ben's Riz Long Grain	Taureau Ailé Riz Méditerranée de Camargue	Lustucru Riz long grain incollable Sélection Tradition	Comptoir du Grain Riz Long Méditerranéen (E.Leclerc)	Saint Eloi Riz Long Grain (Intermarché)	Golden Sun Riz Long Étuvé (Lidl)	Casino Riz Long Grain (Casino)
Best-before date	17/07/2017	28/04/2018	25/03/2018	11/02/2017	18/03/2017	12/02/2017	21/10/2016
Packaging material**	Fresh fibre	Fresh fibre	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	8,4	<5	9,8	505	38	170	405
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	<5	103	<5	<5	52
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	1,1	0,2	not detectable	5,0	0,5	1,4	2,7
Aromatic mineral oils (MOAH) in mg/kg	0,3	not detectable	not detectable	1,1	not detectable	not detectable	0,8

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

F

PASTA

	Barilla Penne Rigate	Panzani la Lasagne	Lustucru Tagliatelles Comme un Chef!	Carrefour Kids Mini Pasta Wheels (Carrefour)	Turini Lasagnes (E.Leclerc)	Combino Farfalle (Lidl)	Monoprix Gourmet Linguine (Monoprix)
Best-before date	01/11/2017	01/03/2018	15/04/2018	07/07/2017	22/02/2018	06/05/2017	04/03/2018
Packaging material**	Fresh fibre	Recycled fibre	Fresh fibre	Recycled fibre	Recycled fibre	Fresh fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	50,1	244	17,1	506	270	23	260
Aromatic mineral oils (MOAH) in mg/kg	<5	39	<5	103	50	<5	42
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	0,2	0,3	not detectable	4,6	not detectable	0,3	not detectable
Aromatic mineral oils (MOAH) in mg/kg	not detectable	not detectable	not detectable	1,1	not detectable	not detectable	not detectable

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

F

CORNFLAKES

	Kellogg's Corn Flakes	Pétales de maïs sucrés (Carrefour)	Chabrior Corn Flakes (Intermarché)	Eco+ Corn flakes sucrés (E.Leclerc)	Monoprix P'tit Prix Corn Flakes (Monoprix)	U bio Corn Flakes (Super U)	Auchan Sugar Flakes (Auchan)
Best-before date	13/05/2016	21/02/2016	07/05/2016	11/07/2016	21/06/2016	27/03/2016	28/05/2016
Packaging material**	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	257	409	383	242	275	286	353
Aromatic mineral oils (MOAH) in mg/kg	41	159	128	91	87	86	107
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	0,6	1,6	3,3	1,6	2,3	1,1	1,5
Aromatic mineral oils (MOAH) in mg/kg	not detectable	0,4	0,9	0,5	0,8	0,4	0,5

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

F

COUSCOUS

	Ferrero Graine de Couscous moyen	Tipiak Couscous moyen	Lustucru Semoule de Couscous Facile	Regia Graine de Couscous moyenne	Saint Eloi Couscous Grain moyen (Intermarché)	Carrefour Bio Couscous Grain moyen (Carrefour)	Pouce Vert Couscous Grain moyen (Auchan)
Best-before date	01/05/2017	01/01/2017	01/02/2017	01/03/2017	02/04/2017	01/04/2017	01/03/2017
Packaging material**	Recycled fibre	Fresh fibre	Recycled fibre	Fresh fibre	Recycled fibre	Recycled fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	296	24	246	271	222	489	237
Aromatic mineral oils (MOAH) in mg/kg	54	<5	48	37	62	138	56
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	1,7	1,2	2,8	1,7	2,4	4,6	2,7
Aromatic mineral oils (MOAH) in mg/kg	0,3	not detectable	0,5	0,3	0,6	1,2	0,4

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

F

LENTILS

	Vivien Paille Lentilles Blondes	Reflets de France Lentille verte du Puy AOP (Carrefour)	Auchan Lentilles corail (Auchan)	Dia Lentilles vertes Bio (Dia)	Notre Jardin Lentilles blondes (E.Leclerc)	U Saveurs Lentille verte du Puy AOP (Super U)	Casino Lentilles vertes (Casino)
Best-before date	17/04/2018	04/2017	01/2017	27/08/2017	17/04/2017	13/09/2017	14/10/2017
Packaging material**	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Recycled fibre	Fresh fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	403	478	289	474	406	113	380
Aromatic mineral oils (MOAH) in mg/kg	93	103	68	112	79	<5	74
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	3,4	2,8	8,5	2,9	2,4	0,7	1,1
Aromatic mineral oils (MOAH) in mg/kg	0,6	0,6	2,7	0,6	0,6	not detectable	0,5

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.

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OTHERS

	Ebly	Van Houten L'Original 100% Pur Cacao	BN Goût Chocolat	Maizena Fleur de Maïzena	Nestlé dessert 100% Cacao Poudre brute non sucrée	Auchan Poudre Cacaotée Bio (Auchan)	Top Budget Purée de pommes de terres en flocons (Lidl)
Best-before date	21/04/2018	25/02/2018	03/2017	04/2018	01/2017	16/03/2017	03/2016
Packaging material**	Recycled fibre***	Fresh fibre	Recycled fibre	Fresh fibre	Fresh fibre	Recycled fibre	Recycled fibre
IN THE PACKAGING							
Saturated mineral oils (MOSH) in mg/kg	418	58	625	41	17,5	350	317
Aromatic mineral oils (MOAH) in mg/kg	<5	<5	32	<5	<5	75	89
IN THE FOOD							
Saturated mineral oils (MOSH) in mg/kg	not detectable	12,8	4,0	0,3	11,6	not detectable	1,1
Aromatic mineral oils (MOAH) in mg/kg	not detectable	1,3	not detectable	not detectable	1,2	not detectable	0,3

**Hypothesis based on the amounts of MOSH and MOAH found in the packaging.
***or waxed fresh fibre.