

## Alternatives to plastic straws: Which materials are suitable?

Communication No 016/2021 from the BfR of 27 May 2021

Drinking straws are single use plastic products which will be subjected to a Europe-wide sales ban from 2021 onwards. This is stated in EU Directive 2019/904 from 5 June 2019. Consequently, alternative materials have to be established for the production of drinking straws as well as other frequently used products which predominantly were made of plastic so far.

As set out in the EU Framework Regulation for food contact material (Regulation (EC) No. 1935/2004), objects that come into direct contact with food must be safe. The German Federal Institute for Risk Assessment (BfR) has appraised straw, silicone, metal, paper and paperboard, durum wheat, and glass for their suitability to replace plastic in the production of drinking straws.

If frequently used, drinking straws made of **silicone**, **stainless steel** or **glass** are, in the opinion of the BfR, an appropriate alternative to plastic straws. Silicone is suitable as a food contact material (FCM) provided that its manufacture is compliant with the specifications of BfR recommendation No. XV. Metals and alloys (e.g. stainless steel) are also appropriate as FCMs, provided that the specifications of the Council of Europe Resolution regarding metals and alloys are met. Glass is also suitable for food contact. However, there is the risk of breaking. As a result, fragments of glass can get into the food or drink and in case of swallowing dangerous injuries can occur. Meanwhile, there are drinking straws made from particularly durable glass.

In case of single use, **durum wheat** (e.g. raw macaroni noodles) is an appropriate material for drinking straws from a health perspective. However, the noodles may decompose, particularly in warm and hot drinks, or over a longer time period, and become useless as a result. Furthermore, they may modify the consistency and taste of the drink. Only industrially produced pasta that does not contain egg as an ingredient should be used.

Straws made of **paper** and **paperboard** are only useful if substances are added which prevent the paper from softening. These compounds are also known as wet-strength aids. Certain residues of these products, especially chloropropanols, can migrate into food. If the specifications of BfR recommendation no. XXXVI are met, no health risks are currently noted with the use of drinking straws made of paper and paperboard.

There are no risk assessments at the moment regarding the use of drinking straws made out of **straw**. The BfR recommends that straw is not used for this purpose with regard to potential health risks resulting from bacteria, mycotoxins, or other unwanted substances.

Regardless of the material, drinking straws used more than once should be cleaned thoroughly every time before using. If thorough cleaning of the drinking straws cannot be guaranteed, the BfR recommends that such multiple-use drinking straws are not used for reasons of hygiene. Furthermore, they should not have any sharp edges and should also be replaced if there are any signs of material damage (signs of wear and tear).

### Stringent standards apply to food contact materials

According to EU Regulation (EC) No. 1935/2004, food contact materials “shall be manufactured [...] so that, under normal or foreseeable conditions of use, they do not transfer their constituents to food in quantities which could [...] endanger human health [...]”. This equally applies to any materials used as FCM.

EU Regulation (EU) No. 10/2011 applies to plastics. It regulates the source materials for the production of plastics which are intended to come into contact with food. It also states the quantities of these materials that may be transferred into food without representing a risk to human health. Lastly, it also lists what further restrictions may apply to a certain use (e.g. whether usage is only permitted for aqueous foods).

At the moment there is no such EU Regulation regarding other material groups. However, there are also national regulations and other specifications. The BfR has established a database with recommendations regarding numerous food contact materials. Whilst this is not a legal set of specifications, it is seen by both industry as well as monitoring bodies as a standard to follow in the context of risk assessment in line with EU Regulation No. 1935/2004.

Natural materials should only be used in gastronomy after careful examination. This is because the catering industry, like all food businesses, must implement a HACCP system ((EC) 852/2004) to prevent the formation of microorganisms that can cause food-borne illnesses. The HACCP system stands for "Hazard Analysis Critical Control Points". Under certain circumstances, some natural materials cannot be used in gastronomy in a HACCP-compliant manner. Owners of catering establishments should seek information from hygiene offices or municipal and regional food inspection authorities.

### **Microplastics are and remain a major topic for the BfR**

Reduction of plastic waste is a matter that is becoming increasingly important to people. Alongside pollution of the environment, citizens are concerned about the production and increasing spread of microplastics. This is also because these small particles can also enter the human body, for example via food.

The BfR is increasingly focussing on microplastics and nanoplastics and does not believe, in accordance with the current state of knowledge, that there are any health risks arising from plastic particles in food. Due to a lack of data, there is currently no conclusive risk assessment. It is suspected that the state of knowledge regarding microplastics will develop greatly over the next few years enabling a more profound assessment of possible health risks in the future.

### **Further information on microplastics is available from the BfR website**

Microplastics FAQ: [https://www.bfr.bund.de/en/microplastics\\_facts\\_research\\_and\\_open\\_questions-192775.html](https://www.bfr.bund.de/en/microplastics_facts_research_and_open_questions-192775.html)

A-Z index regarding microplastics:  
[https://www.bfr.bund.de/en/a-z\\_index/microplastic-200211.html](https://www.bfr.bund.de/en/a-z_index/microplastic-200211.html)



BfR "Opinions app"

### **References**

EU Directive 2019/904:  
<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019L0904>

EU Regulation (EU 1935/2004):

<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32004R1935>

BfR recommendation no. XV:

<https://bfr.ble.de/kse/faces/resources/pdf/150-english.pdf>

Council of Europe resolution regarding metals and alloys:

<https://www.edqm.eu/en/food-contact-materials>

BfR recommendation no. XXXVI:

<https://bfr.ble.de/kse/faces/resources/pdf/360-english.pdf>

EU Regulation (EU) no. 10/2011:

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011R0010>

Database of BfR recommendations regarding food contact materials:

[https://bfr.ble.de/kse/faces/DBEmpfehlung\\_en.jsp?filter=clear](https://bfr.ble.de/kse/faces/DBEmpfehlung_en.jsp?filter=clear)

## About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. It advises the Federal Government and Federal Laender on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

*This text version is a translation of the original German text which is the only legally binding version.*