



# No greenwashing with bioplastics

## Info paper

## More and more packaging waste

No country in Europe produces as much packaging waste as Germany: with 228 kilograms per capita per year, we are the front runner. More and more to-go packaging, pre-portioned food and smaller packaging sizes are exacerbating the problem. The increasing amounts of waste are a burden on the climate and deplete valuable resources. At the same time, more and more packaging waste ends up in nature, e.g. in the sea. Current forecasts predict that by 2050 there could be more plastic than fish in the world's oceans. Although the mountains of waste can be significantly reduced through avoidance and reuse, bioplastic products are increasingly being advertised as a supposedly sustainable solution. These advertising promises about the alleged environmental friendliness of bioplastic packaging in comparison to conventional plastic packaging

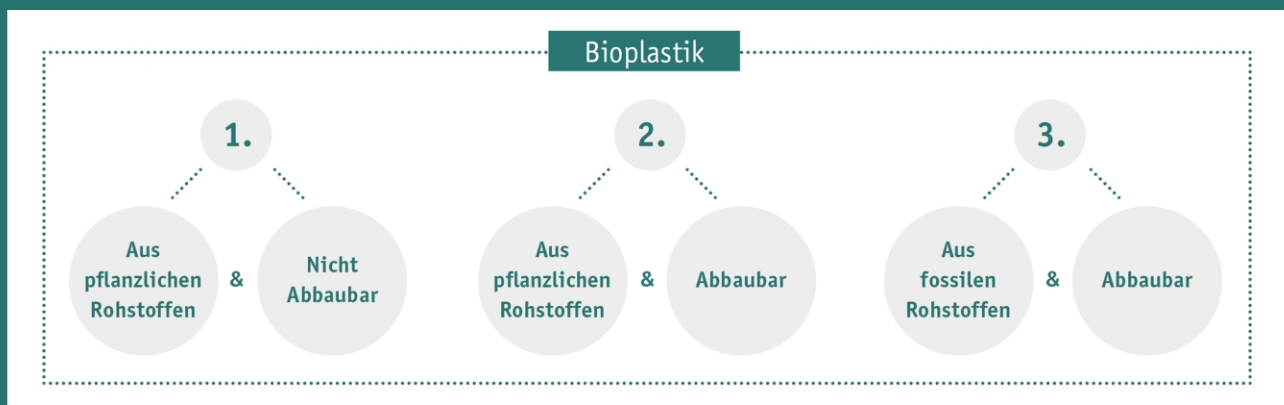
This is what more than 75 per cent of the population believe - as a representative survey by the Kantar opinion research institute commissioned by Deutsche Umwelthilfe (DUH) zeigt.<sup>1</sup> However, bioplastics are often just as harmful to the environment as conventional plastics. With this information paper, DUH would like to clarify the actual environmental consequences of bioplastics and present real solutions.

## Bioplastics are often just as harmful to the environment as conventional plastics

If all environmental impacts are considered, there is generally no overall ecological advantage for bioplastic products compared to conventional plastics - regardless of whether they are degradable or not.<sup>2</sup> This is because the agricultural cultivation of renewable raw materials and the production of bioplastics also pollute the environment.

### Bioplastics remain plastics!

Bioplastic or bioplastic can mean a "biobased" and/or a "biodegradable" plastic. Bioplastic thus refers to plastic that has either been produced proportionately from plant-based raw materials or has been declared as degradable - or has both properties:



"**Bio-based**" means that the plastic has been made partly or largely from renewable raw materials, such as corn or sugar cane. Bio-based plastics can be degradable or non-degradable. One example is bio-PET (polyethylene terephthalate), which is a non-degradable "**drop-in**" bioplastic that can be recycled like conventional PET.

"**Biodegradable**" or "compostable" means that the plastic can be degraded by microorganisms under certain conditions. Corresponding laboratory tests that certify "degradability" are, however, not transferable to natural environments, e.g. the sea or forest. Biodegradable plastics can be made from plant or fossil raw materials. Examples are PLA (polylactic acid) or starch-based bioplastics.

The term "**plastic-free**" is not suitable for bioplastics. Because regardless of whether they are made from plants or are degradable - bioplastics remain, chemically speaking, plastics, i.e. plastic. Even degradable plastic can remain in the environment for a long time and be harmful to humans and animals. The term "plastic-free" is therefore a misleading advertising slogan for bioplastics.



## Mostly no "organic" in bioplastics

The plants used for bioplastics are by no means "organic", but typically come from conventional agriculture. This means that many pesticides and synthetic fertilisers are used and genetically modified plants can also be used.<sup>3</sup> In addition, water bodies are damaged by the input of fertilisers and the soil is polluted, e.g. by overuse and erosion. Therefore, in eco-balances, bioplastics usually have stronger negative effects in impact categories such as eutrophication or acidification compared to conventional plastic products made from fossil raw materials.<sup>2</sup>



## Bioplastics pollute the climate

Bioplastics are often advertised as particularly climate-friendly or even climate-neutral. More than 50 percent of the population believe that bioplastic packaging is more climate-friendly than conventional plastic packaging.<sup>1</sup> Although the use of renewable raw materials as materials for plastic production can replace crude oil or natural gas, large amounts of greenhouse gases are still produced during cultivation and energy-intensive processing into plastic. In addition, there are high transport emissions, as cultivation often takes place outside Europe. In addition, 'indirect land use changes' are usually not taken into account in climate balances. These occur, for example, when the cultivation of sugar cane results in the loss of grazing land, which in turn has to be replaced by rainforest elsewhere. If this were included, typical bioplastics based on sugar cane could have even worse climate balances.

Bioplastik?

## What does the population think about bioplastics?

A representative survey commissioned by DUH and conducted by the opinion research institute Kantar<sup>1</sup> with more than 1,000 respondents reveals that consumers are misled by "green" advertising promises on bioplastics products: Consumers are misled by "green" advertising promises for bioplastic products. The following misconceptions about bioplastics are widespread among the population:

- Over 75 per cent of the population believe that bioplastic packaging is more environmentally friendly than conventional plastic packaging.
- 50 percent of the population would dispose of degradable bioplastic packaging in the organic waste bin
- 23 per cent of the population believe that degradable bioplastic packaging can be left in nature without hesitation.
- 49 percent of the population believe that bioplastics can solve the problem of too much packaging waste

All other results can be found here:

[www.duh.de/bioplastik](http://www.duh.de/bioplastik)

## Bioplastics may contain pollutants

Even if bioplastics are completely or partially made from plants, they can be as harmful as conventional plastics.<sup>4</sup> In some cases, plasticisers, dyes, stabilisers or other additives are also added to bioplastics in order to optimise the plastic properties, which can be harmful to health or the environment. Pesticide residues from agricultural production cannot be ruled out either. Even packaging certified as "compostable" is not guaranteed to be harmless to humans and nature. Therefore, bioplastics should not be released into the environment under any circumstances.

## Bioplastics compete with food production

The use of fertile land for the production of bioplastics further reduces the amount of agricultural land available worldwide. This land is already under massive pressure due to the growing world population and climate change. If the entire global demand for plastics were to be replaced by bioplastics, this would require almost 5 percent of the world's arable land. This would correspond to 75 million hectares of land, i.e. more than twice the area of Germany.<sup>5</sup> It would be irresponsible to produce crops for single-use plastics on this land instead of food. The use of agricultural residues for the production of bioplastics is not automatically environmentally friendly either, because there are often other locally established uses, e.g. as animal feed or fertiliser.



## Bioplastic packaging is generally not composted

Although labels such as "compostable" or "degradable" suggest it, bioplastic packaging is usually not composted and causes major problems for composting plants.

**Degradable bioplastics are regularly not composted in composting plants, but sorted out and subsequently disposed of in incineration plants.**

The results of a waste disposal company survey conducted by DUH<sup>6</sup> among German composting plants shows,

that products made from biodegradable plastics are mostly classified as contaminants by the plants. Composting in accordance with the DIN EN 13432 standard, to which many bioplastics products are certified, takes place in only 5 per cent of the plants. Since bioplastics may not decompose sufficiently during composting, bioplastic residues can reduce the quality of the compost produced and end up on arable land. Therefore, bioplastic products are often sorted out and incinerated before composting. Disposal companies also report problems with "biodegradable" bioplastics when biowaste is processed in biogas plants.

plastics and reject this disposal route. therefore also off.<sup>7,8</sup>

**Tipp!**

### How can biowaste be disposed of in an environmentally friendly way?

Organic waste should never be collected in bioplastic bags, which are sold in shops for this purpose or offered free of charge in the vegetable section of supermarkets. The bioplastic bags can contaminate the compost or lead to methane emissions that are harmful to the climate due to unintentional fermentation of the contents.<sup>9</sup> Only in about 12 percent of German municipalities is the collection of biowaste in biowaste collection bags made of bioplastic even permitted.

#### Tip:

At best, collect your organic waste without a bag in a container that can be cleaned easily. If necessary, you can line the collection container with waxed or unwaxed paper bags or kitchen paper.

## Bioplastics do not belong in the organic waste bin

A representative survey of consumers by the Kantar opinion research institute showed that 50 per cent of respondents would dispose of packaging labelled as "compostable" in the organic waste bin. This reveals widespread misinformation among the population about the correct disposal of bioplastics. According to the Biowaste Ordinance



the disposal of bioplastic packaging of any kind in the organic waste bin is prohibited. Throughout Germany, waste management companies are currently fighting against bioplastics in organic waste through intensive public relations work.<sup>10</sup>

### **Composting bioplastics does not make sense**

The composting of bioplastics does not release any significant amounts of freely available plant nutrients or build up soil substrate. Instead, only CO<sub>2</sub> and water are produced during complete decomposition. The energy and material used in the bioplastics are thus lost unused during composting. From an environmental point of view, it would therefore make much more sense to reuse or recycle the material. Even incineration in suitable plants would make more sense, as at least part of the energy would be recovered.

## **Bioplastics are not a solution to environmental littering**

Bioplastics are often touted as a solution to the careless disposal of plastic packaging in nature - but it turns out that bioplastics could actually exacerbate environmental litter.

### **Problem-free decomposition of compostable bio-plastics in nature is not ensured**

Despite various seals and standards (e.g. DIN EN 13432), certified "compostable" packaging does not guarantee problem-free degradation. This is because the tests to be fulfilled are

only carried out under specially optimised laboratory conditions. However, these conditions are not transferable to degradation in nature, e.g. in forests, meadows or the sea, as completely different conditions prevail there. "Biodegradable" bioplastics can therefore remain in the environment for just as long and cause similar damage as conventional plastics.<sup>11</sup>

### **Environmental litter could even increase**

The representative survey commissioned by DUH and conducted by the opinion research institute Kantar shows that the littering of the environment by bioplastic packaging could even get worse. According to the survey, 23 percent of the population believe that bioplastic packaging advertised as degradable can be left in nature without hesitation.<sup>1</sup> As more and more to-go packaging is made of bioplastics and advertised as compostable, there is a danger that littering of coffee cups and food trays will become an even bigger environmental problem. This would thus be a direct consequence of the systematic misleading of consumers by false advertising promises in connection with bioplastics. At the same time, 49 per cent of the population see bioplastics as a solution to the problem of too much packaging waste and are thus probably less open to demonstrably environmentally friendly alternatives such as reusable or deposit systems.<sup>1</sup>

## **Bioplastics are often not recycled**

Degradable or compostable bioplastics disposed of in the yellow bag are generally not recycled but incinerated as sorting residue. At the same time, 55 per cent of the population believe that degradable bioplastic packaging is more recyclable than conventional plastic.<sup>1</sup> Due to the large variety of bioplastics available, specialised sorting and recycling is often not worthwhile. Compostable bioplastics can even impair the recycling of other plastics. Non-degradable bioplastics that are chemically similar to conventional plastics (so-called drop-in plastics) can be recycled like these if they are disposed of in the yellow bag. Examples of this are bio-PE or bio-PET, which are chemically equivalent to PE and PET.

## Current greenwashing with bioplastics

The misleading claims on bioplastic packaging are becoming more and more extreme. Claims like "environmentally friendly", "green", "plastic-free", "0 per cent waste", "with a clear conscience" are unacceptable.



### Coffee capsules made from degradable bioplastics

Packaging coffee by the gram is resource-intensive and damaging to the climate, regardless of the material used. Increasingly, "compostable" coffee capsules made of bioplastics are being promoted as an environmentally friendly alternative. However, due to serious problems with composting, these capsules may not be disposed of with organic waste. The ban on disposal is reinforced by the renewed Biowaste Ordinance recently passed by the Federal Cabinet. For these reasons, manufacturers



usually refer in the small print to a possible "home composting". However, the decomposition conditions on home compost heaps are usually even worse than in industrial plants (e.g. due to a lower temperature) and there is a risk of contaminating the home garden with plastic residues and pollutants. In addition, the question arises as to how many consumers actually compost the capsules themselves. DUH recommends low-waste brewing methods for coffee, such as refillable reusable capsules, brewing systems with permanent filters, French presses or classic coffee machines.

### Compostable "To Go" cups, cutlery and crockery



More and more cups, food packaging and cutlery are being offered as "compostable" versions for consumption outside the home. The corresponding imprints suggest that the products can simply be disposed of in the organic waste bin after use or that they even degrade in nature without any problems. However, such products are not approved for the organic waste bin and can cause the same damage to nature as products made of conventional plastic. As to-go products made from conventional plastic

While the waste of all plastic often ends up in the environment anyway, the littering could even be aggravated by "com- posable" variants. Especially in out-of-home consumption, there is an urgent need for multi-way systems to reduce the amount of waste!

### Fruit and vegetable bags made from bioplastics

Bioplastic bags are offered in some supermarkets as tear-off bags for packing fruit and vegetables and are advertised with green product names. These bags usually consist of a proportion of renewable raw materials such as sugar cane. However, the question arises as to how environmentally and climate-friendly the production of the bags actually is. This is because the sugar cane is not produced by demonstrably organic farming and has to be transported a long way. In Brazil, the main country of cultivation, the



Sugar cane is usually produced as a monoculture using pesticides and chemical fertilisers.<sup>12</sup> In addition, indirect land use changes can endanger rainforest areas. DUH recommends buying fruit and vegetables in bulk, e.g. at the market, or using reusable nets, which are now offered and accepted in most supermarkets.



## DUH successes against greenwashing with bioplastics

### No more "compostable" plastic bags at Aldi and Rewe



In 2012, DUH discovered that the plastic bags advertised by ALDI Nord, ALDI Süd and Rewe, among others, as "100% compostable" are usually not composted. The three retail chains then stopped the sale of the carrier bags, some of which are made of PLA, and undertook not to advertise with the consumer-deceptive statements in future. As a result, two companies belonging to the plastic bag manufacturer Victor Group sued the DUH and its federal counterpart.

The company's managing director - unjustly - claimed damages of more than 2.7 million euros. The lawsuit was strongly supported by BASF, the world's largest chemical company, which supplied the material for the production of the bags. In the course of the trial, which lasted more than five years, DUH won all of the three court decisions of the Regional and Higher Regional Court of Cologne. In spring 2018, the groups finally failed in the legal dispute before the Federal Court of Justice. DUH was able to successfully stop greenwashed bogus solutions in this and other cases. And it has also achieved another success: a ban on plastic bags will come into force in Germany in 2022. More at: [www.l.duh.de/victor260118](http://www.l.duh.de/victor260118)

### PLA cups at major events

Huge mountains of waste from disposable cups are produced at many major events in Germany. In the 2018/2019 season alone, more than nine million disposable cups were used in the first and second German football leagues. The majority of these cups were made from the bioplastic polylactic acid (PLA), which is advertised as biodegradable. In life cycle assessments, disposable cups made of PLA have a greater impact on the environment and climate than reusable cups.



In addition, the disposable cups were usually incinerated and neither composted nor recycled to any great extent. DUH advocates the use of reusable cups at major events through intensive educational work and close exchange with major event organisers. In this way, we were able to achieve the disappearance of disposable cups made of PLA in most stadiums in the first and second German football leagues and their replacement with environmentally friendly reusable cups. More at: [www.duh.de/becher](http://www.duh.de/becher)

### Activia yoghurt from Danone



DUH stopped a misleading advertising campaign by Danone in 2011. The company had misleadingly advertised its Activia yoghurt cups made of the bioplastic PLA as "more environmentally friendly", although no overall ecological advantage could be proven for the cups compared to conventional plastic cups made of polystyrene. Packaging made of PLA is usually incinerated and not recycled when disposed of in the yellow bag and is not suitable for disposal in the organic waste bin.

admitted. After a warning from Deutsche Umwelthilfe, the company admitted the consumer misrepresentation and signed a declaration to cease and desist. The company undertook not to repeat false statements about the alleged environmental friendliness of yoghurt pots made of PLA. A great success for environmental and consumer protection.

More at: [www.l.duh.de/danone151111](http://www.l.duh.de/danone151111)

**Support our initiative "Bioplastik bleibt Plastik" against greenwashing with bioplastics:**

more at [www.duh.de/bioplastik/](http://www.duh.de/bioplastik/)

## Focus on truly environmentally friendly solutions

We should not be deceived by false promises about bi- oplastic, because there are demonstrably more environmentally friendly alternatives. These include, first and foremost, the avoidance of packaging, the use of reusable systems and packaging made from recycled materials. **The use of disposable packaging - regardless of the material - is harmful to the environment**, as the constant production of new packaging causes climate emissions, wastes valuable resources and, if disposed of incorrectly, litter natural areas. Resources should be used sparingly and materials should be used for as long as possible through reuse and recycling.

### Tips for consumers

Consumers should avoid single-use products and packaging - regardless of the material - wherever possible and use reusable alternatives instead.

This applies in particular to waste-intensive disposable bottles, coffee capsules, disposable cups and to-go cutlery and crockery.

**More at** <https://www.duh.de/the-men/recycling/packaging/>

' Where packaging is unavoidable, care should be taken to ensure that it is recyclable and made of recycled material.

Bioplastics advertised as compostable should never be disposed of in the organic waste bin or in the compost at home.

Organic waste should be collected at home without a bag if possible. If this is not possible, the container can be lined with kitchen paper or waxed/unwaxed paper bags can be used.

### Recommendations for action for manufacturers and dealers

Manufacturers and retailers should reduce packaging **as** much as possible or use it more than once.

If disposable packaging is unavoidable, it should be made from recycled materials and be recyclable.

Misleading advertising with bioplastics should be avoided. Terms such as "compostable", "degradable" and "plastic-free" should not be used.

Packaging should be clearly labelled with disposal instructions in order to avoid incorrect disposal, especially in the bio bin.

### Demands on politics

Waste avoidance must be made mandatory through a national target and reusable systems must be consistently promoted. Measures are also needed to improve the recyclability of packaging and to increase the use of recycled materials.

All policy measures against single-use plastics must also apply to bioplastics in order to prevent evasion.

"Biodegradable" and "compostable" should be banned as advertising terms. Instead, each package should be labelled with a clear disposal notice.

You can find more information on this topic at [www.duh.de/bioplastik/](http://www.duh.de/bioplastik/)



## The German Environmental Aid

Deutsche Umwelthilfe (DUH) is a recognised environmental and consumer protection association that has been actively campaigning for the preservation of our natural resources and for the interests of consumers since 1975. It is politically independent, non-profit, has the right to sue and is active at national and European level. DUH is known, for example, for its role in uncovering the diesel scandal and in introducing a deposit system for disposable drinks packaging. In the field of circular economy, DUH advocates waste avoidance, responsible consumption and a sustainable economy. Further information at: [www.duh.de](http://www.duh.de)

Supported by participants of the



- <sup>1</sup> Kantar Public (2021): Representative survey on the environmental impact of bioplastic packaging, [www.duh.de/bioplastik](http://www.duh.de/bioplastik)
- <sup>2</sup> Federal Environment Agency (2012): Untersuchung der Umweltauswirkungen von Verpackungen aus biologisch abbaubaren Kunststoffen; UBA-Text 52/2012
- <sup>3</sup> Federal Environment Agency (2009): Biodegradable Plastics (Background)
- <sup>4</sup> Zimmermann et al. (2019): Benchmarking the in vitro toxicity and chemical composition of plastic consumer products. In: Environ. Sci. Technol. 2019, 53, 11467-11477 and Zimmermann et al. (2020): Are bioplastics and plant-based materials safer than conventional plastics? In vitro toxicity and chemical composition. In: Environ. Int. 2020, 145, 106066
- <sup>5</sup> Own calculation by Deutsche Umwelthilfe based on Federal Environment Agency (2012) and <https://de.statista.com/statistik/daten/studie/1196555/umfrage/anbauflaechen-und-weideflaechen-weltweit/>
- <sup>6</sup> Deutsche Umwelthilfe (2018): Bioplastik in der Kompostierung: Ergebnisbericht - Umfrage, [www.duh.de/bioplastik](http://www.duh.de/bioplastik)
- <sup>7</sup> Schmidt H, Stutz G, Gruber T (2017): Practical trial to increase biowaste collection in Munich. Rubbish and Waste (2): 60-63
- <sup>8</sup> ANS, ASA, BDE, BGK, bvse, DGAW, VHE, VKU (2019): Position on the disposal of biodegradable plastics via biowaste treatment/composting
- <sup>9</sup> Larsen and Rotter (2015): Impact of compostable plastic bags on greenhouse gas emissions from home composting. In: Proceedings Sardinia 2015, Fifteenth International Waste Management and Landfill Symposium.
- <sup>10</sup> See, among others, the campaign website of "Wir für Bio": <https://www.wirfuerbio.de/>
- <sup>11</sup> Bagheri et al. (2017): Fate of so-called biodegradable polymers in seawater and freshwater. In: Global Challenges 1700048
- <sup>12</sup> Fatheurer (2021): Bioplastik und die Spur des Zuckers, lecture Denkhaus Bremen Aktionsforum Bioökonomie

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