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FACTSHEET

FACTS ON THE USE OF PALM (KERNEL) OILS IN DETERGENTS, MAINTENANCE AND CLEANING PRODUCTS IN GERMANY

Introduction

The detergent, maintenance and cleaning products industry in Germany uses both inorganic and organic ingredients in the manufacture of its products. Some organic ingredients can be obtained based on fossil or renewable raw materials.[1]

In 2008, volumes of ingredients in detergent, maintenance and cleaning products (Wasch-, Pflege- und Reinigungsmittel / WPR products) totalled ca. 630,000 tonnes (excluding water)[2] in Germany. Here, surfactants (surface-active ingredients) have an important role: their input volume amounts to ca. 199,000 tonnes and thus constitutes roughly one third of the total volume of all ingredients combined.[2] Fossil as well as renewable raw materials are suitable for surfactant manufacture. Among renewable raw materials, palm kernel and coconut oils are of outstanding importance, because of the high share of fatty acids of medium chain length (C_{12-14}).[3] In 2008, global production volumes of palm kernel oil and coconut oil totalled 4.8 million tonnes and 3.3 million tonnes, respectively.[4]

However, for WPR products the industry does not use the above oils as such but surfactants manufactured from these oils. In Western Europe, today roughly 20 percent of surfactants in WPR products are based on palm kernel and coconut oils. [5] For Germany, this results in ca. 39,800 tonnes per annum. With fluctuating trade volumes, an exact breakdown into shares of palm kernel and coconut oils in these surfactants is hardly possible. The remaining surfactants (ca. 80 percent) are obtained from fossil raw materials. In view of the public discussion, the following part of this text looks more closely into palm (kernel) oil from oil palms. A fact paper on coconut oil is currently being prepared.

Oils from oil palms and their uses

Initially, oil palms were cultivated predominantly to obtain palm oil, which is mainly used as a food ingredient. Since the beginning of the present century, the use as energy (biodiesel) has also been gaining in importance.[6]

Oil palms are cultivated on ca. 12 million hectares globally (2008).[7] Major cultivation countries of oil palms are Malaysia (34 percent of cultivation area worldwide) and Indonesia (43 percent of cultivation area worldwide).[7]

The fruits of oil palms provide two different types of oil: oil from fruit flesh is called "palm oil"; oil from fruit kernels is called "palm kernel oil". Depending on origin, yields per hectare range between 3.5 to maximally 7 tonnes of palm oil and 0.4 to 0.8 tonnes of palm kernel oil.[8] In 2008, the average yield globally was 3.7 tonnes of palm oil per hectare.[7] Typically, this corresponds to 18 tonnes of fruit ("fresh fruit bunches").

In comparison with palm oil, obtaining palm kernel oil requires more technical effort and more energy input. Since the 1960s, the growing cultivation of oil palms has additionally increased - by almost tenfold - the produced volumes of palm kernel oil.[9] As compared with palm oil, the use of palm kernel oil in the food sector is much lower.

Sustainability aspects in the selection of the various raw material sources

There are no significant differences between surfactants based on fossil or renewable raw materials, as they are used in WPR products – neither regarding performance nor in respect of price. At present, mainly fossil raw materials (e.g. crude oil) are used in surfactant manufacture. However, fossil raw materials are increasingly becoming an ecological, economic and political challenge, inter alia against the backdrop of the ongoing climate debate, the risk of accidents in maritime transport, the finiteness of these resources, and the political situation in producer countries.

The use of renewable raw materials can provide an alternative to fossil non-renewable resources; it can also contribute to climate protection.[10] The sustainability assessment of palm kernel oil - as a renewable raw material in surfactant manufacture – depends on the ecological, economic and social conditions in which palm kernel oil is produced.

For altogether positive effects of palm (kernel) oil on the environment and the socio-economic situation in countries of origin, certain sustainability criteria need to be taken into account in the cultivation and harvesting of oleiferous fruits:

- **Ecological goals: Nature conservation** (e.g. maintaining biodiversity and particularly valuable habitats, such as rainforests and grasslands), **climate protection** (e.g. protection of land with high carbon capture, such as peatlands and wetlands), and **environmental protection** (preserving the quality of soil, water and air).

- **Socio-economic goals** (e.g. protection of indigenous groups of the population, working conditions on plantations, land right issues, income of the workforce to ensure sufficiently high standards of living).

Developments are by no means sustainable where tropical primary forests are cut down or where peatlands are drained for oil palm plantations.

Where tropical rainforests are cleared or where peatlands are ploughed up and drained, the climate balance is negative for products from palm (kernel) oil, too. For example, a tropical natural forest in Asia binds some 138 tonnes of carbon per hectare, as compared with only 30 to 50 tonnes bound by a palm oil plantation. The differential of roughly 100 tonnes of carbon means a non-binding of carbon dioxide (CO_2) of 365 tonnes per hectare of land. CO_2 balances for palm oil plantations are even less favourable where natural forest was cleared by slash-and-burn or where Carbon - stored in layers of peat several metres high - release CO_2 into the atmosphere.[6]

Also degraded areas (such as suitable fallow and waste lands) can be used for the cultivation of oil palms.[11] Further increases in yields can be achieved through higher productivity (improved plant materials, modern cultivation and harvesting techniques). These measures could be sufficient to cover future rises in demand (palm oil for foods and biodiesel), without resorting to lands worthy of protection.

In the years from 2006 to 2009, areas for oil palm cultivation were extended significantly (in Malaysia from 3.7 to 4.1 million hectares and in Indonesia from 4.1 to 5.4 million hectares), partly through a changeover in the use of existing plantations for other tropical crops (e.g. rubber plantations). In Malaysia, two thirds of the increase (1.4 million hectares) in cultivation area of oil palms in the period from 1990 to 2000 were attributable to this changeover.[6]

In the changeover of existing plantations (e.g. rubber plantations) into oil palm plantations, possibly arising competition for areas for agricultural or forest uses – for the production of basic foods, energy sources and other renewable raw materials – needs to be taken into account, where applicable.

In the ecological-agricultural perspective and also from the viewpoint of the impacted rural population, the cultivation of oil palms in monocultures can

cause problems, because there is a potential for destroying the economic, social and cultural basis for living, mainly for indigenous population groups.

However, with the very high productivity of oil palms[12], the palm oil industry makes important contributions not only to nutrition but also to the gross domestic product and to export proceeds of cultivation countries. For example, in 2008 the palm oil industry in Malaysia generated ca. 18 billion USD and employed 800,000 people[13] (population of Malaysia: ca. 24 million).

Supply chain for surfactants based on palm kernel oil

In the manufacture of surfactants based on palm kernel oil, the supply chain starts with plantation companies or oil palm farmers. They harvest oil palm fruit from which palm oil is obtained, usually directly at the plantation. Palm kernels are more durable – for this reason, they are frequently stored prior to processing or they are transported to oil mills and processed into oil. Beside other raw materials, surfactant manufacturers buy palm kernel oil on international spot markets.[14] They supply surfactants, inter alia, to producers of WPR products. At present, there is no infrastructure, which could provide an alternative to the purchase of large volumes of surfactants from palm kernel oil.

Share of surfactants based on palm kernel oil in WPR products in Germany

2008 in Germany some 39,800 tonnes of surfactants based on palm kernel and coconut oil are used in WPR products. If these surfactants were manufactured exclusively on the basis of palm kernel oil, some **50,000 hectares of agricultural land*** - or ca. 0.42 percent of worldwide cultivation areas for oil palms – could cover the annual demand for palm kernel oil for surfactants in WPR products in Germany. This would correspond to roughly twice the city area of Frankfurt am Main in the year 2009. This calculation is based on the assumption that ca. 1 tonne of palm kern oil is needed for the manufacture of ca. 2 tonnes of surfactants.[5]

* This estimate is based on the **following assumptions:**

- Some 20 percent (ca. 39,800 tonnes) of the surfactant input for WPR products in Germany in 2008 are obtained based on palm kernel oil and coconut oil. An exact breakdown into shares of palm kernel and coconut oils is not possible, due to fluctuating trade volumes. Therefore, in this calculation an exclusive use of palm kernel oil is assumed.

- Roughly 1 tonne of palm kernel oil is needed for the manufacture of ca. 2 tonnes of surfactants. This mean value for yield is calculated for

surfactants obtained from palm kernel oil and individually depends on the type of surfactant.[5]

- Based on this mean value for yield, in 2008 ca. 19,900 tonnes of palm kernel oil are needed in Germany for the manufacture of surfactants in WPR products. Simultaneously obtained palm oil is available for other uses.

This would roughly correspond to 0.42 percent of the annual global production of palm kernel oil and, consequently, require a cultivation area of around 50,000 hectares. **The required cultivation area would be roughly twice the size of the city area of Frankfurt am Main.**

Aspects of action for industry and consumers

The WPR industry in Germany is no driver in the increasing cultivation of oil palms, but this industry is committed to its responsibility as a user of thus obtained palm kernel oil. The following applies to several producers of WPR products:

- When purchasing surfactants, they demand information from surfactant manufacturers about how the input palm kernel oil was produced.
- They support initiatives enabling surfactant manufacturers to purchase palm kernel oil - which is produced in a sustainable and responsible manner - on the world market.

The first step towards the development of sustainability criteria for the palm oil industry is the initiative *Roundtable on Sustainable Palm Oil* (RSPO, www.rspo.org). The RSPO membership comprises delegates from operators of oil palm plantations, palm (kernel) oil traders, the processing industry, consumer goods manufacturers, banks and environmental/nature conservation and social organizations (NGOs). In November 2007, the RSPO established a certification scheme for the sustainable production and trade of palm oil. First volumes of certified palm (kernel) oil have been commercially available since November 2008.

With the ISCC system[15] a further scheme for the certification of sustainably produced biomass – including, inter alia, palm (kernel) oil - is available from 2010.

With an increasing use of products based on renewable raw materials in the WPR industry, an involvement of consumers and a responsible and transparent communication with consumers are getting more and more important.

As a matter of principle, the following applies: renewable resources are not per se sustainable or non-sustainable. A differentiated examination of cultivation and production conditions is needed.

Facts at a glance:

	Geographical reach	Period	Volume
WPR products, ingredients	Germany	2008	ca. 630,000 tonnes
Surfactants	Germany	2008	ca. 199,000 tonnes
Surfactants based on palm kernel oil and coconut oil	Germany	2008	ca. 39,800 tonnes
Surfactant yield from 1 tonne of palm kernel oil (mean value)	Germany	2009	2 tonnes of surfactant
Palm oil production	global	2008	43.1 million tonnes
Palm kernel oil production	global	2008	4.8 million tonnes
Average productivity	tonne of palm kernel oil per hectare of cultivated land	2008	3.7 tonnes per hectare
Lauric acid share in palm kernel oil	-	-	ca. 40 – 52%
Crude oil price (Brent)	-	Jan. 2008	ca. 470 €/tonne
Price of palm kernel oil	-	Jan. 2008	ca. 830 €/tonne
Tropical fallow and waste lands	Indonesia	2006	ca. 10 million hectares
Cultivation area – oil palms	global	2009	ca. 12,8 million hectares
Cultivation area – oil palms	Indonesia	2009	ca. 5.4 million hectares
Cultivation area – oil palms	Malaysia	2009	ca. 4.1 million hectares

1 According to the Agency for Renewable Resources (Fachagentur Nachwachsende Rohstoffe e.V.) (2007), renewable raw materials are products generated in agriculture and forestry, which are channelled into uses in the non-food sector (http://www.nachwachsende-rohstoffe.de)

2 IKW (2009): Nachhaltigkeitsbericht für die Wasch- und Reinigungsmittelbranche in Deutschland: Berichtsjahre 2007 und 2008 (Sustainability report for the detergent and cleaning products industry in Germany for the reporting years 2007 and 2008), Frankfurt am Main

3 Including lauric acid; therefore, these oils are frequently called "laurics".

4 Oil World Annual, 2008, USDA-FAS August 2008

5 Market estimate by the Project Group for Renewable Resources in FORUM WASCHEN, July 2009

6 WWF Deutschland (2007): Regenwald für Biodiesel? Ökologische Auswirkungen der energetischen Nutzung von Palmöl, Frankfurt am Main (Rain forest for biodiesel? Ecological impacts of the energy utilisation of palm oil), Frankfurt am Main

7 Oil World Annual, 2009

8 Wuppertal Institut für Klima, Umwelt, Energie (September 2007): Sozial-ökologische Bewertung der stationären energetischen Nutzung von importierten Biokraftstoffen am Beispiel von Palmöl, Wuppertal (Wuppertal institute for climate, environment, energy (September 2007): Socio-ecological evaluation of stationary energy use of imported biofuels on the example of palm oil)

9 D.M. Coronacion, Coconut Industry Investment Fund, Philippines, personal communication

10 Van Zutphen, Hans (2008): Comparative LCA Analysis of Different Edible Oils and Fats. Lecture (recorded in written form) at the "International Palm Oil Sustainability Conference" 13/15 August 2008, Sutera Harbour Resort, Kota Kinabalu, Malaysia.

11 T. Fairhurst, D. McLaughlin, Sustainable Oil Palm Development on Degraded Land in Kalimantan, WWF, January 2009

12 Soy oil 0.36 tonnes/hectare, sunflower oil 0.42 tonnes/hectare, rapeseed oil 0.49 tonnes/ hectare, palm oil 3.7 tonnes/hectare – source: MPOC (Malaysia Palm Oil Council)

13 Int. Herald Tribune, 10.09.2009

14 A spot market is a market where an agreed transaction – consisting of delivery, acceptance and payment – is carried out directly.

15 ISCC – International Sustainability and Carbon Certification, www. iscc-project.org