

# **eco@work**

Sustainable reading from the Oeko-Institut

## What to eat?

Healthy food,  
small footprint

Capital refectories  
Interview with Gabriele Pflug

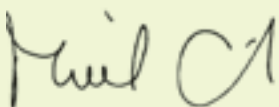
## Enjoy your meal

The theme of the latest edition of eco@work is sustainable food. What can we add to the organic movement's familiar mantra: "organic – local – seasonal"? In this magazine we don't dispute that there are always both environmental and health advantages to buying organically produced foods, supporting local farming and eating foods in season, especially as they mostly taste better than produce grown under glass. And I just love eating strawberries when they are properly ripe. But are all the organic claims actually true? And should we restrict ourselves to the rule of three I quoted above when talking about sustainable food? Or doesn't it instead merit a more comprehensive examination that, as a scientific institute, we both can and want to give?

You may be aware of my personal interest in historic events and developments. Growing food and eating meat – in the past much less than now, of course – has always been a part of man's cultural history; food production has always been an important economic factor. Today, as a result of globalisation, that applies even more to food flows. At the same time there are always other factors too, environmentally and socially significant ones, associated with food. Think of the pollution of rivers and seas that we have been causing for many decades through the extensive use of mineral fertilisers. And the increasing transportation of fruit, meat, and finished products such as baked goods, which generates additional greenhouse gas emissions. In many countries of the world, social structure is determined by dietary habits – for years there has been criticism, rightly so, of agricultural speculation, rising food prices and inequitably distributed resources for production, which prevent sustainable farming.

There are thus many facets to the topic of sustainable food – we can't deal with them all in this issue of eco@work. That is why, with our expertise as an environment and sustainability institute, we are focusing on the aspects of environmental performance, resource conservation and climate change mitigation. We believe that, to do this, we need to look at the whole environmental footprint. A simple carbon footprint is not enough; instead an integrated study of factors such as land requirement, emissions, and material and energy consumption is needed. You will find detailed articles on this in our In Focus section. As always, our interview presents the viewpoint of someone we work with.

I hope you enjoy this issue,



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“Of course there’s always more to do”



Eating in the refectory? That still makes a lot of people think of tasteless mass-produced meals prepared in a hurry rather than delicious healthy food. However, in Berlin lunch in the refectory means vegetarian and vegan dishes, MSC-certified fish, meat, and an organic meal as well. In the capital’s refectories, which cater on average for a total of 37,000 visitors a day, numerous steps have already been taken to provide the customers, who often have limited food budgets, with varied and sustainable dishes. In her interview with eco@work, Gabriele Pflug of the Studentenwerk Berlin, the student services corporation of the city of Berlin, talks about how she got started on more sustainable cooking, her current projects and her other plans for more sustainability in the refectories and cafeterias.

**Ms Pflug, what were the Studentenwerk Berlin’s first steps towards more sustainability in the refectories?**

They were small steps at first, such as using organic potatoes and occasionally organic meat. Then in 2003 we received certification for a complete organic meal, which is served daily in the refectories.

**What measures have you implemented since?**

Well, for example, our fish dishes have been MSC-certified since 2011, and we only use organic eggs now. A lot of vegetarian dishes are available, and we also offer vegan food in the thirteen largest refectories. We haven’t used glutamate for a long time, we don’t use GM foods, and we are trying gradually to reduce declarable additives. We also serve fair-trade coffee in selected coffee bars. As well as this we have introduced a new food traffic light system in the refectories.

**What does that mean exactly?**

The foods are labelled with a green, yellow or red dot. This is an evaluation method that has been developed in collaboration with Professor Peinelt from the Hochschule Niederrhein University of Applied Sciences and is based on the recommendations of the German Nutrition Society (DGE). The labelling helps the visitors to choose a balanced meal: the foods with the red dot should be eaten only rarely, those with the yellow

dot occasionally and those with green as often as possible.

**You have also been working for about a year on the introduction of an environmental management system based on the European Eco-Management and Audit Scheme, or EMAS, for short.**

That is correct. Last year we made a lot of progress towards that. We produced a carbon footprint of the food we use and an environmental programme with corresponding guidelines. We also developed a number of measures, from changing the light bulbs and switching completely to organic cleaning products to ways of reducing waste. Besides this, the staff have undergone thorough training in order to save resources. Our target is to have six of our refectories EMAS-certified in the first half of 2014.

**How do you manage to operate sustainably and still offer your meals at affordable prices?**


First of all, we receive subsidies from the state of Berlin. In addition there are price differences in the food: higher value dishes are more expensive than the standard meals, of course. On top of this, the students pay less for the food than university staff and their guests.

**You have already implemented a very large number of measures. Is there anything else left to do?**

We are very happy with the things we have already achieved, but of course there is always more to do. For example, we want to make significant cuts in the number of paper cups that are used in the refectories and cafeterias. At the moment it stands at more than three million a year. In a bid to reduce this number we are offering the CampusCup. This is a very nice reusable china mug, which can be obtained in the refectories and cafeterias for four euros. We also want to introduce even more local produce in all food groups. Until now this has only been used to a very limited extent, owing to the lack of accessible sources.

**Thank you for talking to us.**

Interview by Christiane Weihe.

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Talking to eco@work: Gabriele Pflug from the Studentenwerk Berlin.

# Not for the price in the shops





## How much does our food really cost?

We do it every day. Several times. Sometimes without thinking, sometimes consciously. Sometimes without even noticing it, sometimes employing all the senses. Eating is part of life, like breathing or sleeping. Where, how and what we eat has a major influence on our well-being and our health. Our food doesn't just affect us, however, but the environment, climate and society as well. That is because a range of environmental and societal effects are associated with the production of food. These incur costs, such as for drilling for fresh drinking water resources on account of pollution from pesticides or fertilisers in other supplies. As part of a donation-funded project, the researchers at the Oeko-Institut have analysed which greenhouse gas emissions are caused by different dietary styles and which external costs – that is, costs that are not included in the shop price – are attributable to food.

## More sustainability



Food is responsible for approximately one fifth of the greenhouse gas emissions generated in Germany, and more than half of these come from agriculture. Some of the emissions arise from the digestive process of ruminants such as cattle. "The greenhouse gas methane is produced during fermentation", explains Dr. Jenny Teufel, a scientist at the Oeko-Institut, "but greenhouse gases are also produced by fertilising soils or if meadows and pastures are ploughed up for arable fields." Oeko-Institut researchers analysed the extent of the potential greenhouse gas emissions of different dietary styles for the donation-funded project titled "Is good food really expensive?" "We looked at a vegan diet and an ovo-lacto vegetarian diet, that is, containing no meat, but including eggs and dairy produce", Teufel reports, "and as well as that we investigated the greenhouse gas emissions for a style of diet based on the recommendations of the German Nutrition Society (DGE), and for a high-meat diet, which approximates the average dietary style in Germany." In this comparison the high-meat diet had the highest potential emissions, at around 1.8 grams of carbon dioxide equivalent per calorie

(g CO<sub>2</sub>e/kcal). However, someone following the DGE's recommendations – so reducing his meat consumption by 60 per cent in comparison with the high-meat diet, while at the same time increasing his consumption of dairy produce by around 30 per cent – is responsible for around 1.58g CO<sub>2</sub>e/kcal, equating to 12 per cent fewer greenhouse gas emissions. "The most sustainable type of diet from a climate perspective excludes meat, dairy produce and eggs altogether", says Jenny Teufel. "An ovo-lacto vegetarian diet generates 1.34 grams of carbon dioxide equivalent per calorie, while a vegan diet produces just 1.13 grams."

So, a shift in diet to low-meat meals benefits the environment and the climate. "And switching to organic food is an important step as well", says Teufel, "as key sustainability requirements underlie its production." However, she continues, food based on organic produce also means higher costs for the consumer – in particular, meat produced organically is more expensive than meat from conventional farms. "Our study showed that aspects relevant for many consumers, such as animal welfare and

the traceability of feedstuffs, have their price", she explains. Under these circumstances many households cannot afford to switch completely to organic food. However, a more sustainable diet is possible and achievable even without a total change in dietary style. "Reducing the consumption of meat and dairy produce is very important, because these two product groups have a major impact on the environment and the climate", says Teufel. "For example, people who enjoy fish should definitely avoid endangered species." Consumer behaviour is a crucial factor on the path to environmentally responsible food as, after all, almost a third of food-related emissions are generated by private consumption – this includes driving to the shops, food storage and preparation, and washing up. "It makes a difference to the climate balance if I use a pressure cooker or not", explains Dr. Teufel. She thinks consumers could do a lot in this respect, and also where shopping trips and planning their shopping are concerned. "We should combine a lot of errands and do them as sustainably as possible – ideally on foot or by bicycle", she says, "and besides this, we should only buy the things we really need



## Private consumption

and actually use – far too much food is thrown away, which of course has consequences for the environment as well.”

People who follow this simple guidance can make an important contribution to more sustainability with little cost to themselves. Moreover, our own shopping expenditure is not the only economic cost associated with our food. “In addition there are what are known as the indirect, or external, costs”, says Jenny Teufel. “By these we mean those costs that arise in the production of an item, but are not included in its price – for example, social costs from unsustainable production practices, or costs arising as a consequence of the environmental impacts of production. These costs are borne by society in the consumer or producer countries.” If, for example, nitrates or pesticides from

These cost every EU citizen at least 100 euros every year. “Health costs, too, resulting from excessive consumption of foods such as meat, milk and sugar, are included in the wider sense in the indirect costs of food”, says Dr. Teufel. “In most countries the treatment of obesity accounts for one to three per cent of the cost of the health system, and in the USA it is as high as five to ten per cent.” In addition, excess weight is regarded as one of the main causes of type 2 diabetes mellitus. “According to the Federal Statistical Office, health costs of over six billion euros arose in Germany in 2008 from diabetes mellitus alone”, says Teufel. The treatment of other diseases resulting from an unhealthy diet, such as obesity and adiposity, and cardiovascular diseases, which can occur as a consequence of excess weight, generates additional costs.

by consumers”, Teufel continues. “They bear them indirectly, for example via European or national budgets.”

Through the donation-funded project the Oeko-Institut researchers have gathered a wealth of important information. Nevertheless, Dr. Jenny Teufel stresses that further research into all kinds of aspects of nutrition and food systems is needed. Gathering comprehensive data is a particular concern. “In addition, it is my view that new indicators must be defined for evaluating food production”, she proposes. “Energy efficiency is not always the right indicator.” Food systems are also a matter of quality of life and the preservation of cultural landscapes. The question is: How might a sustainable diet that is fair for all be configured in the future?




## New indicators

farming contaminate groundwater, this creates costs for such things as drilling for fresh drinking water supplies and treating acute and chronic illnesses caused by pesticide use, costs from the emergence of pesticide resistance and the loss of biodiversity, and costs from developing and implementing statutory measures to limit the damage. A 2005 study put the annual cost arising from pesticide use at almost 121 million euros in Germany alone. The massive use of antibiotics in conventional livestock farming is blamed for the emergence of antibiotic resistance – costs are being incurred in the development of new antibiotics, although these have not yet been calculated. Also included in the indirect cost of food are farming subsidies such as those regulated by the EU's Common Agricultural Policy (CAP).

As part of the donation-funded project, the Oeko-Institut researchers investigated which external costs can be of specific significance for a product, using the example of fresh tomatoes. “We compared production in Holland, Spain and southern Germany”, explains Jenny Teufel, “which showed that in Holland financial support for the modernisation and expansion of glasshouse culture is clearly not factored into the price.” She points out that in Spain it is predominantly the improvements in the water supply infrastructure for tomato growing that create external costs. Furthermore the fact that, in comparison to the national cost of living, lower wages are paid there than in Germany and Holland plays a major role. “In such cases the state may have to help out. External costs of this sort are not met directly

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# My yoghurt – saint or sinner?

## The difficult path to the environmental footprint

The yoghurt isn't any whiter. It isn't any easier to stir. And it probably doesn't taste any different, either. As with other products, you can't generally see whether food has been produced in a way that protects or harms the environment. That is why the Product Carbon Footprint (PCF) is an important aid. It calculates the greenhouse gases that are emitted in the life cycle of a product or a service. However, the PCF does not take account of the numerous additional environmental impacts such as resource consumption and land use. This is set to change with the Product Environmental Footprint (PEF), covering products and services, the introduction of which has been initiated by the European Commission. It's the right idea, say the Oeko-Institut experts, but they are far more critical of the process of implementing it.

"In general, standardising the environmental audit of food is a very challenging process, on account of the numerous stages in the value chain and the frequently changing supply relationships", says Carl-Otto Gensch of the Oeko-Institut. For example, a calculation of the carbon footprint of frozen produce conducted on behalf of the Deutsche Tiefkühlinstitut (German institute for the frozen food industry) showed clearly that the type of product source per se does not permit conclusions to be drawn about the carbon footprint. "The analysis showed that the composition of dishes, the storage of the food and the method of preparation have a considerable influence on the carbon footprint", explains Gensch, who is Head of the institute's Sustainable Products and Material Flows Division.

But if there are so many different factors and the outcome is heavily dependent on consumer behaviour as well – does the Product Carbon Footprint have any point at all? The Oeko-Institut scientist believes it does. "The Product Carbon Footprint and the analyses based on it provide a better understanding of the carbon balance of products and services – for businesses, politicians and for consumers, too", he explains. For example, the PCF enables us to identify production stages with high greenhouse gas emissions and to develop countermeasures. It makes product comparisons and the promotion of climate-neutral products and services possible. However, Gensch also stresses the difficulties of the PCF. "Firstly, there are all the different PCF product labels that don't refer to unified internation-

ally binding standards", he says. "That makes the labels difficult to compare and not very credible." That is why he believes that binding product group-specific auditing rules, or Product Category Rules, are needed. A complex challenge – the Oeko-Institut researchers are currently demonstrating this in a study of possible ways of integrating the PCF in Germany's Blue Angel ecolabel scheme. They are undertaking a case study of dairy produce on behalf of the German Federal Environment Agency in which they are analysing the different sources of emissions and the associated potential for reductions. They are also working with the Institute of Technology in Berlin (TU Berlin) to quantify the PCF and the Product Water Footprint (PWF) for various feedstuff systems. In addition to this they will consider what cri-





teria might be applied for the possible award of an ecolabel relating to the PCF and PWF. "As the basis of dairy produce, milk has been chosen for the analysis, because it is responsible for a comparatively high proportion of greenhouse gases", explains Gensch. The analysis already shows how difficult it is to identify a suitable indicator for assessing food in terms of water consumption and emissions. "For example, you can't base it on the use of concentrated feeds, because water consumption and emissions can vary considerably according to their composition", says the expert, "so you need other approaches – such as ones using different scenarios of feed composition. However, whether these can be applied in practice and can therefore be implemented remains to be seen".

At the same time the initial findings of this analysis again make it clear to the Oeko-Institut experts that a simple greenhouse gas inventory falls short of the mark. Every product and every service can impact on many different environmental areas – that can be seen with global warming caused by greenhouse gas emissions as well as with over-fertilisation of soils and the consumption of finite resources. It is precisely these impacts that the European Commission now wants to take into account by means of an integrated method. In 2013, in its communication "Building a single market for green products", it recommended the introduction of the Product Environmental Footprint (PEF), as well as the Organisation Environmental Footprint (OEF) for businesses and other organisations. In the same


year a three-year testing period was launched, during which the availability and quality of the lifecycle data is to be improved and consistent rules for different products and sectors are to be developed. The testing period for food begins in 2014, and applications could be submitted to the Commission until the end of March. "The PEF is the right way forward, because it takes account of numerous other factors besides greenhouse gases that affect the environment, including toxic emissions to water bodies, particulate emissions, and changes in land use", explains Gensch.

## The problem: how to implement it

However, the experts believe that, despite all the advantages of introducing a PEF, the procedure involved carries a multitude of problems with it. "The process by which the PEF is to be introduced must be viewed critically to some extent", explains Gensch. "In the first place, that is because the normal approach to procedures of this sort – which is that the crucial criteria for the products are determined by government bodies and then agreed

with manufacturers and retailers – has been reversed in this instance." This means that the industry stakeholders have considerable power to define which lifecycle phases of the product under investigation are significant, and which indicators are relevant to capture each specific type of environmental impact. "That is the wrong way to go about it", says Gensch, "although there will be consultations with stakeholders, and key decisions have to be approved by a steering committee. From our experiences of other policy areas at European level, however, we are justified in fearing that criticisms and objections can no longer be voiced appropriately by this point and won't have any chance of success." Furthermore, Gensch thinks that it is extremely unclear how environmental and consumer associations can be adequately involved in the process of introducing the PEF. "You would have to give them the opportunity to familiarise themselves properly with the details, but they would need the appropriate funding", he says. However, even if the scientist is more than unhappy with the introduction process, he won't give up on it. "We will of course continue to contribute ideas and constructive criticism when we think it is appropriate. We have been asking for an instrument like the PEF for a very long time – so we will definitely get involved if we think the implementation is flawed."

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