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Stockholm Resilience Centre
Research for Governance of Social-Ecological Systems
A centre with: SEI Stockholm Environment Institute, The Beijer Institute of Ecological Economics
Stockholm University

Manna – environmental research in a new light

How many gallons of water does it take to produce a bottle of beer?

The successful exhibition *Manna — Food in a new light* shows the connection between ecosystems and the food on our tables and will be on display at the Swedish Embassy, House of Sweden in Washington, between 1 April and 7 June, 2009.

Manna is an unusual exhibition about food, the environment and our hidden dependence on nature. Developed by Albaeco and the Stockholm Resilience Centre at Stockholm University it was first exhibited in Stockholm autumn 2004 and has since then continued its successful tour around Sweden. The Washington exhibit is the starting point of an ambition to bring the exhibition to an international audience.

"The goal is to show how the foods we eat originate from nature by using a visual, pedagogic approach to describe the food production systems and the global trade systems that we are all a part of, says Christina Schaffer", assistant director of the Stockholm Resilience Centre at Stockholm University. "Manna is constructed like a theatre set, so parts of the exhibition are customised for each new location to maintain its artistic quality."

The theme of the exhibition is food and the environment with focus on so-called ecosystem services – the benefits that nature provides to society. Human well-being and development are completely dependent on these services, for example purification of air and water, climate stabilisation, erosion control, pollination of crops and natural pest control.

The exhibition also introduces the research concept "resilience"– the capacity of a system to deal with change and continue to develop. In agriculture, resilience involves the ability to deal with everything from climate change and pest outbreaks to changes in policy and increased costs of inputs.

"A key message is that future agriculture must be based more on biodiversity and local ecosystem services, than on monocultures and fossil fuels, to cope with future changes in climate and ecosystems. Another message is that now when half of Earth's population lives in cities, we need nature more than ever, says Fredrik Moberg", director of Albaeco.

More information on the Manna exhibition:
Please read more about Manna, watch movies and enjoy recipes at:
www.mannautstallningen.nu Some samples from the exhibition are provided below.

About the organizers

Albaeco is an independent organisation communicating the latest in sustainability science with a focus on Nature's importance to society and the economy.
www.albaeco.com

The *Stockholm Resilience Centre* is a new international centre that advances transdisciplinary research for governance of social-ecological systems with a special emphasis on resilience - the ability to deal with change and continue to develop. The centre is a collaboration between Stockholm University, the Stockholm Environment Institute and the Beijer International Institute of Ecological Economics at The Royal Swedish Academy of Sciences.
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Manna - research in a new light

Below are some samples from the Manna exhibition. Please read more about Manna, watch movies and enjoy recipes at www.mannautstallningen.nu

How to fit 25 gallons of water into one small bottle of beer?
That beer drinking leads to many visits to the loo is familiar to most of us. But did you know that it takes about 25 gallons of water to produce a small bottle of beer? Funnily enough, these two liquids have almost nothing to do with each other. Most of this water goes to farming the barley that is later transformed into malt at the brewery.

A warmer, thirstier and hungrier planet
Already today more than a billion people suffer from a lack of water. Now, a rising demand for water-demanding foodstuff, like meat and milk, from a growing middle class is adding further strains on water resources. To solve this incompatibility, farmers of the world are going to have to make better use of every drop of water than they do today.
Most developing countries are situated in regions that already are dry, and are projected to become even dryer due to climate change. It would be disastrous for them to shift to the thirsty diets found in much of the western world.

How many insects does it take to make a hamburger?
It sounds like a hygiene warning for restaurants. But the cattle that became the hamburger meat probably ate feed that contained alfalfa, which is pollinated by several insect species. The wheat in the bun was wind-pollinated, but the mustard, tomatoes in the ketchup, cucumber, pepper, onion and lettuce, they are all to varying degree dependent on pollinating insects. So, no insects, no fast-food lunch!

Both domesticated and wild pollinators are in serious decline because of disease, pesticides and changes in the modern-day agricultural landscape. In southern China people have to pollinate apple flowers by hand, and it takes 10-12 people to replace the work of one beehive. According to one estimate, the loss of natural pollinators is causing a loss of between 6 to 8 billion dollars – just in the US. Every third bite of the US diet is dependent on a honeybee to pollinate that food. Beekeepers now earn many times more renting their bees out to pollinate crops than in producing honey.

Over 90% of all flowering plants and more than two thirds of the world's most important food crops are dependent on pollinators – like bees, birds and bats – to set seed and fruit.

Cows on the road again
Each American eats on average 270 grams of meat a day. Of these 80 grams are beef. This means that it takes about 2000 cows per day to provide Washington D.C. (5.3 million people) with beef. What would it look like if they came walking alive along the roads every day? If Americans were to reduce meat consumption by just 20 percent it would be as if all switched from a standard sedan to an ultra-efficient hybrid electric mid-size car. Similarly, a study from Japan estimated that a kg of beef is responsible for the equivalent amount of carbon dioxide emitted by the average European car every 250 kilometers.

Meat matters more than miles
Almost a fifth of all the world's greenhouse gas emissions are caused by livestock production, according to the UN Food and Agriculture Organization. This is a bigger share than all the motor vehicles in the world! This is because raising meat requires huge amounts of energy and petroleum-based pesticides and fertilizers applied to grains to feed the animals. But the climate–meat connection is not only about fossil fuels. It is also due to forests being cleared to create new pastures, and cows and sheep burping out methane and nitrous oxide, which are much more powerful at trapping heat than CO2.

www.mannautstallningen.nu