

CO₂-eq-emissions of organic and conventional foodstuffs in Austria

Results summary of 74 CO₂-balanced products

Executive summary

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Project information:

Project commissioned by:

- Werner Lampert Beratungsges.m.b.H. / Hofer KG
- Austrian BMLFUW

Duration: 1,5 years (since July 2008)

Review:

Öko-Institut Freiburg (Assessment of the following products: Milk, Bread, Onions)
Research Institute of Organic Agriculture (FiBL) Switzerland

Internet-Link to the Project:

<http://www.fibl.org/de/oesterreich/schwerpunkte-at/klimaschutz.html>

1 Objectives of the study

The goal of this project was, and is, to compare the greenhouse gas emissions (CO₂ eq) of organic/ecological foodstuffs, with foodstuffs grown conventionally, and to render the results visible for the consumer. The organic foodstuffs and the conventional foodstuffs (with which these are to be compared) are retail products. This means that the processing and marketing of the products takes place on the level of nationwide supermarket companies. The following products were/are being balanced:

90-100 foodstuffs: dairy and bread products, eggs, fruit and vegetables as well as fruit juices in 3 categories:

- Organic premium line, „Zurück zum Ursprung“ - Back to the origin (Bio ZZU)
- Organic EU standard (Bio_EU)
- Traditional (conventional) foodstuffs (KONV)

2 Methods

2.1 Methods

The CO₂-balance was conducted as a „Life Cycle Assessment“ (LCA) according to the guidelines of the IPCC (2007). In the process a climate assessment model was developed, which was based strictly on the international eco-balance guidelines (ISO 14040 and 14044). The CO₂-balance was carried out along the entire supply chain, from the agricultural production including intermediate production, over the processing, packaging, storage to the retail of the product and the individual

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supermarket branches. An external review was carried out by the FiBL Switzerland and the Öko-Institut, Freiburg.

The greenhouse gases included are:

CO₂, CH₄, N₂O, which were calculated in the form of „CO₂-equivalents“ (CO₂-eq) (Climate-affecting-factor of CH₄: 23; climate-affecting-factor of N₂O: 298).

The balances were compiled using the program SIMA PRO 7.1.

2.2 Data

Detailed primary data in the areas of agriculture, transport, processing, packaging and distribution were accessed from the Austrian supermarket corporation HOFER KG's organic product line, „Zurück zum Ursprung“. On the basis of this primary data it was possible to calculate an Austria-specific „supermarket standard“ for transport, processing, packaging and distribution.

Besides the databases GEMIS 4.42 and ECOINVENT, secondary data from approx. 200 national and international publications in the area of CO₂-balance of foodstuffs, was consulted. Approx. 20 Austrian and international statistics, as well as current national and international literature regarding CO₂-Balance evaluation made it possible to take the specific production conditions in Austria, as well as the current level of knowledge about CO₂-balance evaluation and land use change into consideration.

2.3 Metodological specifics

2.3.1 Consideration of effects which have so far received little attention

The following effects, which have received little attention in CO₂-Balance evaluations to date, were considered:

- a) **Land Use Change:** Consideration of the destruction of savannas and tropical land through soja cultivation (over 90% of soja used for animal feed in Austria is imported from Brazil).
- b) **Humus accumulation** through organic/ecological agriculture

2.3.2 Modeling comparable, conventional products

In principle the same „supermarket standard“ was used for the conventional products with regard to transport, processing, packaging and storage, as was used for the organic products being sold in supermarket chains .

The conventional agriculture was modeled:

- with regard to the Austrian agrarian environmental program, „ÖPUL“.
- Conventional farms come from the same regions as the organic farms. As a result the production conditions are comparable to those of the organic farms, with regards to the climatic, locational and geographical conditions.

3 Results

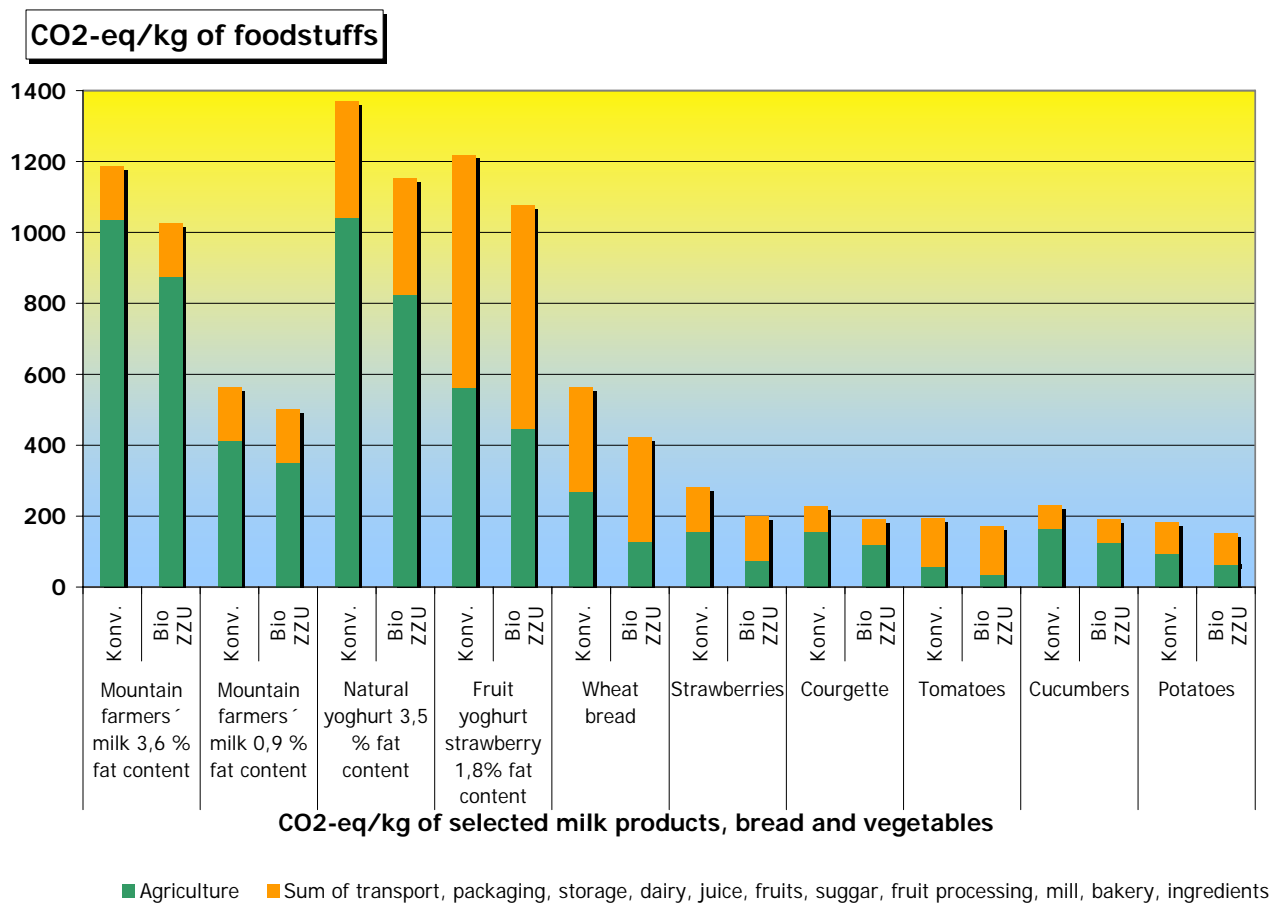
To date 74 products (in each case KONV, Bio-ZZU and, in part Bio-EU) have been evaluated: dairy products (47 products), fruit and vegetables (currently 15 products), bread products (currently 12 products). This summary only presents the results of selected products in the KONV and Bio-ZZU categories.

3.1 Results summary

Organic products of the brand „Zurück zum Ursprung“ (Bio-ZZU) constantly display lower CO₂-eq- Emissions than comparable, conventional products:

- Dairy products: **10 - 21% lower** CO₂-eq-emissions (based on 1 kg of the product)
- Wheat bread: **25% lower** CO₂-eq-emissions (based on 1 kg of the product)
- Vegetables: **10-35 % lower** CO₂-eq-emissions (based on 1 kg of the product)

Figure 1 and 2 display the results in more detail. These clearly show the varying level of CO₂-eq- emissions, depending on the foodstuff. These range from 170 g CO₂-eq / kg (vegetables) upto almost 25.000 g CO₂-eq / kg (butter).



Bilanz CO₂ eq, Lindenthal et al./FiBL Österreich, Wien 2009

Figure 1: CO₂-eq-emissions of selected foodstuffs (dairy products with low fat content, wheat bread and vegetables) in the conventional (KONV) and organic (BIO-ZZU) categories.

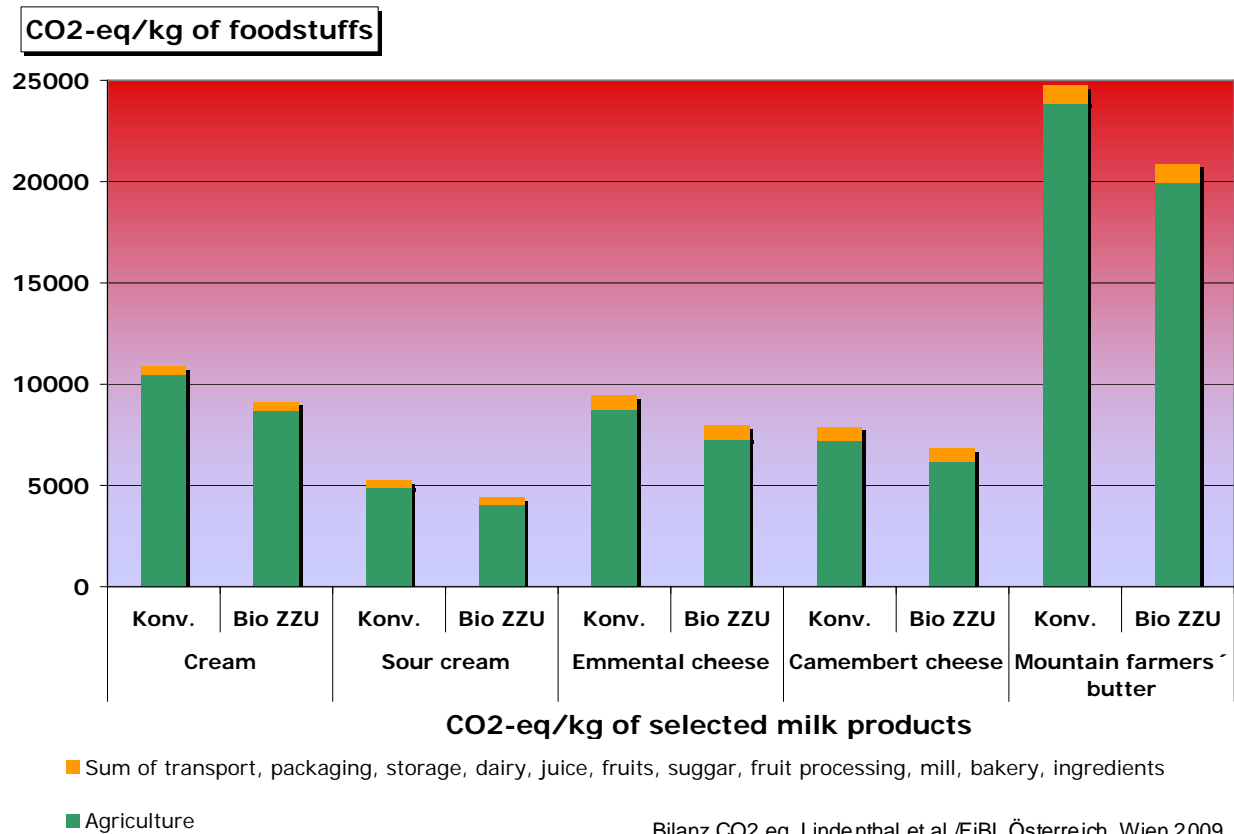


Figure 2: CO₂-eq-emissions of selected dairy products with high fat content in the conventional (KONV) and organic (BIO-ZZU) categories.

Further important results:

- In the case of dairy products, transport generally only accounts for 5-10% CO₂-eq-emissions/kg product. With bread and bread products, 5-15%. Only in the case of open-land vegetables does the share of transport in the total CO₂-eq-emissions/kg product make up for 20-50%. Thus the role of transport is often over estimated in the public discussion. In the case of transport, it is important to consider the efficiency of the transport means (advantages in transport with ships and large trucks compared with small trucks).
- An important CO₂-saving effect in foodstuff processing is the avoidance of convenience, for example the freezing and re-baking of dough pieces in the production of bread(rolls). Bio-ZZU does not use dough pieces, which increases the CO₂-saving of organic bread rolls from approx. 20-25% to over 40% (using the conservative estimate, that only half of conventional bread rolls which are sold in supermarkets, are made from dough pieces).

4 Internet links to the project results:

<http://www.fibl.org/de/oesterreich/schwerpunkte-at/klimaschutz.html>

<http://www.zurueckzumursprung.at/co2-fussabdruck/co2-ihres-produktes>

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