The value of food
- How valuable is our food?
- How valuable is our food for us?

Emmerich Berghofer
Department of Food Science and Technology,
BOKU - University of Natural Resources and Applied Life Sciences,
Vienna, Austria
Problems to correctly handle such a surplus of food:

- Our genes have determined that when you see food, grab it, because you don’t know when it will come again.

- With this surplus the value of food as well as its use seems to be diminishing.
Basic possibilities of shaping our food supply

- **Hunting and gathering societies** *(duration: million years)*
  The collected or bagged raw materials were eaten either raw or after preparation (e.g. by using fire).

- **Agricultural and stock-breeding societies** *(duration: about 10,000 years)*
  Food availability shifted to a mainly vegetable diet.
  Consumers were detached from the source production and became buyers of raw materials which were processed to edible food in the households.

- **Industrial and post-industrial food production** *(beginning before about 150 years)*
  Consumers are changing more from raw product buyers to buyers of pre-prepared products and to even buyers of ready to eat food or meals.
  The relationship of the consumer to food is reduced even more to the activities of: choosing - buying - paying - consuming.
Convenience food:
A food, typically a complete meal, that has been pre-prepared commercially and so requires minimum further preparation by the consumer.

Convenience degrees or steps of preparation

- READY TO EAT
- READY TO HEAT
- READY TO MIX
- READY TO COOK
- READY FOR KITCHEN PROCESSING
- FRESH CUT
- INITIAL GRADE
Convenience Food

The higher the degree of convenience, and the longer the time between preparation and consumption

• the lower is the shelf life

• and the more and more intensive preservation methods, food additives or more extensive packaging are necessary!

Each additional measure, however, will have a negative influence on the nutritional and sensorial quality of the food.
Values of Food

The concepts of value and quality of food are closely related and in English are even used as synonyms.

Value concepts in connection to food:

• nutritional value and/or health value
• sensorial value
• convenience value
• economical value
• ecological value
• ethical value
• political value
Values of Food

• nutritional value and/or health value
• sensorial value
• convenience value
Convenience Value

Convenience is not only important for the degree of cooking but also in all areas of food supply:

• during shopping *(e.g. fast and easily done, one shop stop, no queues at counters)*

• during storage *(e.g. longer storable without special precautions)*

• during packaging *(e.g. easy to open and reclose without utensils)*

• during cooking if still necessary
  o easier preparation
  o faster preparation
  o lower energy need

• during eating
  o edible without special utensils *(→ finger food)*
  o necessary utensils can be integrated into the packaging *(→ spoon, straw, etc.)*
  o can be eaten everywhere and time *(→ fast food, street food, snacks, etc.)*
  o quickly made edible *(e.g. quickly soluble → instant products, self-cooling or heating packages)*
Values of Food

• nutritional value and/or health value
• sensorial value
• convenience value
• economical value
The economic value of food can be regarded from different viewpoints. The most important questions in this respect are the following:

a) What is the cost to produce our food or which share of primary energy is used for food supply?

b) How much do the individual national economies or countries expend for the food supply and how much do the individual consumer classes within these states?

c) Why does value increase or how is it possible to get a higher price or profit within each segment of the food supply system?
Economical Value

What is the cost to produce our food?

Our food supply requires a huge amount of energy, consequently this share in the countries of the North is continually increasing:

1974: US food cycle consumes...about 12 % of the total national energy budget (Hirst, 1974)
1996: Food system consumes close to 16 % of the total energy use in the US (Hendrickson, 1996)

About a fifth of the energy required for the food system is used in the agricultural area.

The production of 1 kg of meat requires namely 10-20 kg of vegetable raw material.
On the average 3 calories of energy are required in order to obtain 1 food calorie, but 35 calories for 1 beef calorie.
Economical Value

How much do the individual national economies or countries expend for the food supply?

ENGEL’S LAW

„The poorer the family, the greater the proportion of its total expenditure that must be devoted to the provision of food... The proportion of the expenditures used for food, other things being equal is the best measure of the material standard of living...”

"... je ärmer eine Familie ist, einen desto grosseren Antheil von der Gesamtausgabe muss zur Beschaffung der Nahrung aufgewendet werden ..."


Engel coefficient = share of the expenditure for food in percent of the total consumption expenditures

Economical Value

How much do the individual national economies or countries expend for the food supply?

Average Food Shares by Per Capita GDP (Gross Domestic Product)

Economical Value
How much do the **individual consumer classes** expend for the food supply?

**Food expenditures in Germany 1850-2004**
[\% of total household expenditures inclusive of drink and tobacco]

- 1850: 61\%
- 1900: 57\%
- 1925: 47\%
- 1950*: 44\%
- 1975*: 23\%
- 2004: 16\%

*) früheres Bundesgebiet

Quelle: AIF, Stat. Bundesamt

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Economical Value

How much do the **individual consumer classes** expend for the food supply?

Daily food expenditures as a share of total expenditures for students of University of California

Values of Food

- nutritional value and/or health value
- sensorial value
- convenience value
- economical value
- ecological value
Ecological Value
Decreasing Use of Biodiversity

~ 250,000 grain and seed plants exist.

4,000 can be potentially used for human nutrition.

30 plant species cover about 90% of the nutrition energy supply.

3 cereal species cover about 50% of the nutrition energy supply worldwide.

About 30,000-50,000 food products in our supermarkets are mainly produced from only about 30 raw materials!
Ecological Value
Food Packaging

Our present food supply requires an ever larger packaging expenditure.

- About 10% of the energy required for the food supply is due to packaging.

- The share of the packaging costs for the entire sales price is very high and can amount to up to 40% or more.

- In Germany 27% of the household refuse is due to food packaging.

- The higher degree of packaging ensures a lower food loss
  -> Inverse relation between the amount of food loss and the amount of packaging refuse.
Ecological Value
Food Packaging

Ecuador: The Ayme family of Tingo.
Food expenditures for 1 week: $ 31.55

Ecological Value
Food Packaging

Germany: The Melander family of Bargteheide.
Food expenditures for 1 week: $ 500.07

Mali: The NATOMO family of KOUAKOUROU. Food expenditures for 1 week: $ 26.39
United States: The Revis family of North Carolina.
Food expenditures for 1 week: $341.98
In spite of

- our food is traveling more and more and coming from the entire world to our supermarkets

- and the transportation expense has almost doubled during the last 30 years

we are spending continually less for our food.
Lebensmittel werden erschwinglicher
So lange mussten Arbeitnehmer für den Kauf von Lebensmitteln arbeiten

<table>
<thead>
<tr>
<th>1970</th>
<th>Arbeitszeit in Minuten</th>
<th>2004</th>
</tr>
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<tbody>
<tr>
<td>96</td>
<td>1 kg Schweinekotelett</td>
<td>22</td>
</tr>
<tr>
<td>72</td>
<td>1 kg Rindfleisch zum Kochen</td>
<td>23</td>
</tr>
<tr>
<td>16</td>
<td>1 kg dunkles Mischbrot</td>
<td>11</td>
</tr>
<tr>
<td>22</td>
<td>10 Eier</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>250 g Butter</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>1 kg Kartoffeln</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>1 l Milch</td>
<td>3</td>
</tr>
</tbody>
</table>
How can this discrepancy between the decreasing prices of food for the consumer be explained while the expenses for the production and distribution are increasing?
### Eco-indicator 99 for Vegetables

<table>
<thead>
<tr>
<th>Eco indicator points per kg</th>
<th>integrated production</th>
<th>organic agriculture</th>
<th>greenhouse production</th>
<th>Agricultural production</th>
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</thead>
<tbody>
<tr>
<td>Region</td>
<td>Europe, lorry</td>
<td></td>
<td></td>
<td>Airplane (0.83)</td>
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<tr>
<td>Conservation</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Packaging</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td></td>
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</tbody>
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Ecological Value

Food Waste

Share of littered food is very high!

- Whereas previously the amount of waste or spoilage was usually in the area of the primary production (post harvest losses) this problem has now been shifted to the processed packaged food.

- A declaration of the **best before date** is legally prescribed for packaged food. Until this date food must preserve its typical characteristics or be consumed. Expired or almost expired products present a problem for the shops.

- The main share of food waste comes from the households, e.g.:
  - USA: 26-30 % of all food is thrown away.
  - Great Britain: 33 % of all purchased food is disposed of as garbage.
Values of Food

• nutritional value and/or health value
• sensorial value
• convenience value
• economical value
• ecological value
• ethical value
Ethical Value

- Food surplus exists only in the countries of the North for a majority of the population, while at the same time about a billion humans are threatened by starvation.

- It is certainly not ethically defensible to endanger or limit the food supply of the countries of the South in order to produce the cheapest agricultural raw materials for use as feed or energy production.

- A fairer producer price for food from poorer countries should also be evident (→ fair trade).
Chad: The ABOUBAKAR family of Breidjing Camp.

Food expenditures for 1 week: $1.23
If the disadvantages of the present form of food supply should be reduced, the following prerequisites should be fulfilled:

• The commerce and the consumers must realize that food does not have an unlimited shelf life and this should be as short as possible.

• The consumers accept that a higher price must be paid for mild preservation techniques.

• Newer and faster distribution methods should be established in order to keep the temporal and spatial span between processing and consumption as short as possible.

• The sustainability in all areas of the food production system should be better observed.
Thank you very much for your attention!