Low input organic pasture beef (OPB) production

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Contents – low input organic pasture beef production

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Grassland plays a crucial role

- It can’t be used directly to feed the human population
- It involves recycling to produce valuable human food
- This recycling is only feasible by ruminants
- Milk displays highest transformation efficiency, with approx. 45% of plant energy and proteins are converted to human nutrition
- By contrast, meat as by-product of milk only has approx. 15% efficiency in energy transformation
% transformation of plant energy & proteins

<table>
<thead>
<tr>
<th>animal species</th>
<th>product</th>
<th>protein</th>
<th>plant energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>cattle</td>
<td>milk</td>
<td>48</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>meat</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>pig</td>
<td>meat</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>chicken</td>
<td>eggs</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>meat</td>
<td>26</td>
<td>6</td>
</tr>
</tbody>
</table>

Different sources of protein from livestock:
- ruminants - roughage
- monogastric animals - grain & soya concentrates
Input / output energy ratios of some foods, and of high and low input beef

Conventional intensive farming

Mainly organic farming

Animal food
- milk, meat

Plant food
- citrus, fruit, greenhouse winter vegetables, potatos

ratio
- 500:1, 50:1, 10:1, 5:1, 1:2, 1:50

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Grassland is limited in Switzerland

- Switzerland’s total land surface is approx 4 million ha

  - 1.2 million ha mountains, wilderness, lakes, urban 30%
  - 1.2 million ha forest 30%
  - 0.5 million ha alpine meadows 13%
  - 1 million ha agricultural usage, 25%
    - of which 0.7 million ha natural & artificial
    - grassland (grass + clover)

- total meadows + alpine grassland 1.2 million ha

- production needs to be adapted to local conditions
Extensive production of beef

- emphasis on GRASSLAND
  - summer - pasture,
  - winter - grass silage & hay, and outdoor run
  - daily gain 700-800 gr

- low input / low cost

- aim: low cost barns, technology, work load, energy

- This contrasts with intensive beef production with maize, concentrated feed, in barns or feed lots with 1000 to 1500 gr. of daily gains, but a high energy input
Appropriate farms – organic pasture beef

- Those converting
  - have high investments in milk production
  - are seeking to reduce their working hours or make them more flexible
  - have steep grassland which requires lighter animals
  - have available grassland from crop rotation
Which breeds?

› beef breeds (75% beef breed) offspring of suckler cows
› cross breeds with dairy cows (minimum 50% beef breed)
› just heifers and steers
› no bulls
Which breeds?

Good source of fodder
- hills
- mountains, good location

Less good quality fodder
- hills, alpine pastures
- higher mountains, poor location

1. Crossbreed with Limousin

2. Crossbreed with Blonde d’Aquitaine, just heifers

3. 100 % pure Simmental just steers

4. 100 % pure Swiss Brown just steers

2. 100 % pure Simmental just heifers

3. 100 % pure Swiss Brown just heifers
Breeds – Angus suckler cow herd with Limousin bull
Options for low input organic pasture beef

Crossbreed of dairy cows (minimum of 50% beef breed)

Rearing for 6 months on the milk farm, 200 kg live weight

Fattening: 15-20 Mth
Slaughtering: 21-26 Mth

Offspring of suckler cows (with 50 or 75% beef breed)

Weaning in the suckler cow herd up to 8-10 Mth

Fattening: 9-13 Mth
Slaughtering: 17-23 Mth
Offspring
Castration

› safety reasons
› in the first 3 weeks
› no half steers (unfertile bulls, bad castration)
   › act like bulls, restless in herd, have bad daily gains

› castration
  › with anaesthetics, use a vet
  › surgical removal of testes
  › no elastic rings
Castration – badly / wrongly castrated bull
Castration – badly / wrongly castrated bull
Castration – badly / wrongly castrated bull
Husbandry for low input organic pasture beef

› minimum 8 hrs/day pasture during
  › vegetation period

› daily outdoor run in winter

› free stall system

› straw bedding in the lying area
Husbandry - deep litter takes a lot of straw
Loading and transport

› quiet and without stress
› drivers have to be trained
› both ears tagged
› transport documents for vet and for organic supply chain
› good place for loading
› no pushing or driving with electric device
Loading - good ramp facilities are important
Barns

› simple – use or rebuild the old barn
› barn design: feeding place leads directly to outdoor run,
› divide into 2 or 3 groups
› separate and adequate space for lying down
› permanently accessible outdoor run
› strong paddock fences
› feeding bars for holding animals during feeding
Barn dimensions for low input organic pasture beef

<table>
<thead>
<tr>
<th>Per animal</th>
<th>mother cow height at withers 135 +/- 5 cm</th>
<th>to 200 kg LW</th>
<th>to 300 kg LW</th>
<th>to 400 kg LW</th>
<th>above 400 kg LW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total area incl permanently accessible walking yard (m²)</td>
<td>10</td>
<td>4.5</td>
<td>4.5</td>
<td>5.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Lying area bedded with deep litter (m²)</td>
<td>4.5</td>
<td>1.8</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>Feed pen depth (m)</td>
<td>3.2</td>
<td>1.60</td>
<td>2</td>
<td>2.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Feed pen width (m)</td>
<td>0.72</td>
<td>0.45</td>
<td>0.50</td>
<td>0.60</td>
<td>0.70</td>
</tr>
<tr>
<td>Walking corridor width min. (m)</td>
<td>2.40</td>
<td>1.20</td>
<td>1.35</td>
<td>1.60</td>
<td>1.75</td>
</tr>
<tr>
<td>Lying box width (m)</td>
<td>1.2</td>
<td>-</td>
<td>-</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Lying box length – wall (m)</td>
<td>2.4</td>
<td>-</td>
<td>-</td>
<td>2.1</td>
<td>2.4</td>
</tr>
<tr>
<td>Lying box length – opposite (m)</td>
<td>2.2</td>
<td>-</td>
<td>-</td>
<td>2.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Outdoor run, no roof (m²)</td>
<td>2.5</td>
<td>1.3</td>
<td>1.3</td>
<td>1.5</td>
<td>1.8</td>
</tr>
</tbody>
</table>
Barn converted from dairy purposes
Barns – feeding bars to separate animals
Barns – the paddock fence must be strong
Barns for suckler cows with fattening of weaners

- keep weaners for fattening in separate groups
- a lot of straw is needed in deep litter systems
- for older animals choose cubicles for lying area
- use enough straw in the lying area
Barns – use enough straw in the cubicles
Feeding aims

› proper carcass weight - 300 kg in CH
› proper finishing (fat)
› proper carcass quality
› proper meat quality
› lots of roughage in the ration
› lots of pasture grass (cheap feed)
› Little (or no) use of concentrated feed (expensive)
Feeding crossbred offspring from dairy cows

› 600 to 900 litres milk; temp 37- 38.5 oC  
› dummy at the height of the calf’s head  
› continual access to fresh water  
› good quality hay  
› salt and minerals  
› a little concentrated feed  
› important  
› the calf should come off the milk two weeks before changing farm  
› no milk with antibiotic residues
Feeding

› during growth period age 5-13 months, 200-350 kg live weight

› roughage of best quality (ad libitum)
› enough protein
› when weaners come in young 30 kg concentrated feed

› between growth & fattening age 13-20 months, 350-475 kg live weight

› roughage (ad libitum)
› lower feed quality requirement
Pasturing

Animals between growth and fattening can easily be pastured in alpine meadows.
Feeding

› during fattening period age 20-24 months, 450-550 kg live weight
› carcass weight & finishing must be reached
   › best quality roughage ad libitum
   › higher energy content in the ration
› heifers - no concentrated feed necessary
› steers up to max. 150 kg of concentrated feed
Pasture management to control external parasites - rumen and intestinal worms

Correct:
- Pasture weakly contaminated
  - Older fattening cattle & cows above 12 mths

Incorrect:
- Pasture strongly contaminated
  - Heifers 6-12 months

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Slaughter

› 18-26 months
› 500-550 kg live weight
› 280-310 kg carcass weight
› breast measure 196 cm
› age – maximum 2 shovels
### European carcass and fat classification

<table>
<thead>
<tr>
<th>Fatty tissue class</th>
<th>optimal meat quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excessively fat</td>
<td>C, H, T, A, X</td>
</tr>
<tr>
<td>Even</td>
<td>1, 2, 3, 4, 5</td>
</tr>
<tr>
<td>Not covered</td>
<td></td>
</tr>
</tbody>
</table>

#### Meatiness class
- **Very meaty**
- **Average**
- **Very skinny**

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Swiss-Ukrainian Project "Organic Market Development in Ukraine" 
Швейцарсько-український проект «Розвиток органічного ринку в Україні»
Taxation EUROP
Paying attention to the finishing
Economic factors

› duration of fattening period
› quality of carcass
› price of weaner
› price for carcass
› breed of the bull
› farm fixed costs
› direct payments by local / national govt.
Meat quality parameters for low input OPB

› colour
› pH under 5.8 is a meat default DFD (dark, firm, dry)
› fat - intramuscular fat, IMF
› composition of fatty acids
› loss of water when grilled at 70-80 oC
› tenderness
Intramuscular fat, IMF, and tenderness

› a lot of intramuscular fat, IMF does not necessarily mean tender meat

› less fatty meat can also be tender

› Organic pasture beef is very tender meat (below 40 N shear strength)
Essential fatty acids

› fatty acids Omega 3 and 6 have to come in with food
› lowers the cholesterol level
› good for heart circulation system
› aim for  Omega 6 : Omega 3  =  5 : 1
› today  10-20 : 1
› pastured animals have more Omega 3 fatty acids,
   › aim for more than 40 mg
Average price for organic pasture beef

› current average EU price for OPB
  › per kg carcass weight
    › ~ Euro 3.70
Consumer motives for buying organic pasture beef, OPB

- Caring cattle husbandry appropriate to species: 68%
- Cattle feeding appropriate to species: 51%
- Better quality of meat: 45%
- Preference for pasture beef: 38%
- Preference for organic food: 20%
- Concern about BSE: 20%
- Other reasons: 3%

% of reasons from Swiss consumers of OPB

Source: Swiss market research, 2011
Control and certification

› integrated in annual organic control & certification
› unannounced controls during the year
› important control documents
   › vet journal
   › pasture & outdoor run journal
   › journal of purchased organic feed

traceability is key for consumer trust!
Organic beef labels - eg Swiss Association of OPB

- an association of producers, animal dealers, retailers
- mandatory membership
- label ‘owned’ by leading Swiss retailer
- aims
  - partnership with trading partners
  - promote quality at all levels
  - sales promotion
  - stable prices
  - exact planning of
    - production quantity
Summary - 1

› Low input organic pasture beef is well adapted for Swiss grassland and pastures from the plains to the mountains

› OPB allows for high quality organic beef to be grown under extensive farming conditions

› OPB can be produced with weaners from suckler cows or beef cross breeds from dairy cows

› Animal husbandry and feeding of OPB fulfills the highest possible criteria for animal protection & wellbeing
Summary - 2

› Low input OPB is strictly controlled
› a large proportion of consumers want this premium beef
› quality of carcass is very good - by Swiss & EU standards
› price for the farmer is good
› price for the consumer is acceptable, + 10%

› meat quality is very good - it loses less water,
is tender, healthy and has a lot of desirable fatty acids
Low input OPB farm in Swiss mountains