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Faculty of Agriculture
and Food Sciences

Research Institute of
Organic Agriculture
Switzerland

Joint Bachelor Course on Organic Agriculture 2014

Lecture 9 (2): Organic Cattle Husbandry

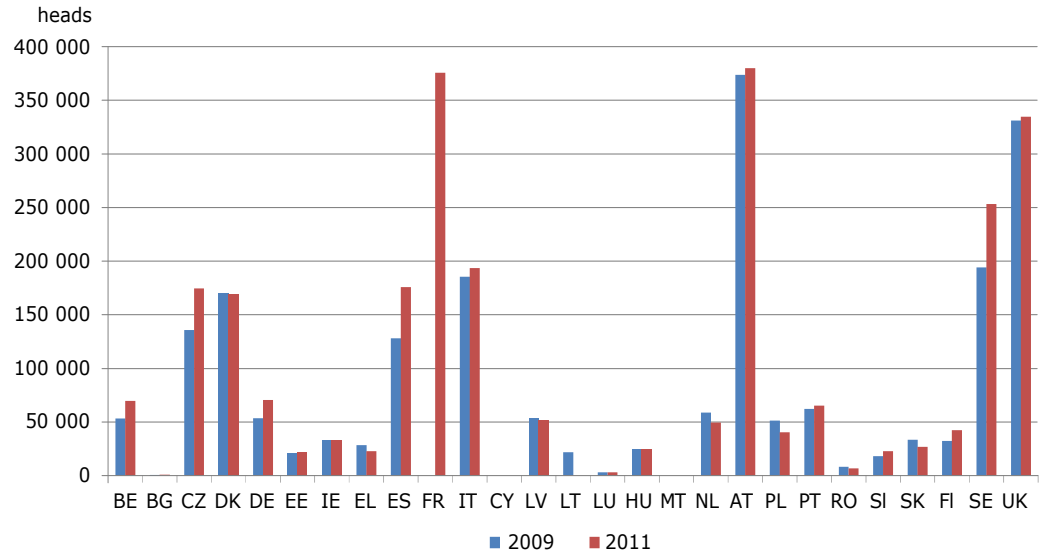
Authors: Anna Bieber (annabieber@fibl.org) (overall, dairy cattle) and Eric Meili (eric.meili@fibl.org) (beef)

SNF/SCOPES

Organic cattle husbandry in the EU

- In 2011 : 2.6 mio. heads of certified organic cattle in the EU-27→12% growth/ year from 2005 to 2011
- largest producers of organic cattle according to available data:
  - 1. Austria, 2. France, 3. the United Kingdom, followed by Sweden, Italy and Spain.
- importance of the organic sector in relation with the whole bovine sector:
  - highest in Austria (19%), Sweden (17%), Latvia and the Czech Republic (about 13% each) and Denmark (10%).

Graph 29. Number of certified cattle in 2009 and 2011 in the EU Member States



Source: Eurostat data on the basis of Council Regulation (EC) No 834/2007 on organic production (online data code: food_in_porg3). Data for DE from BLE study Strukturdaten im ökologischen Landbau in Deutschland 2011*. Data for AT for 2011 from* Grüner Bericht 2012*. Estimated data for IE and LU (2011). Missing data for CY and MT.*

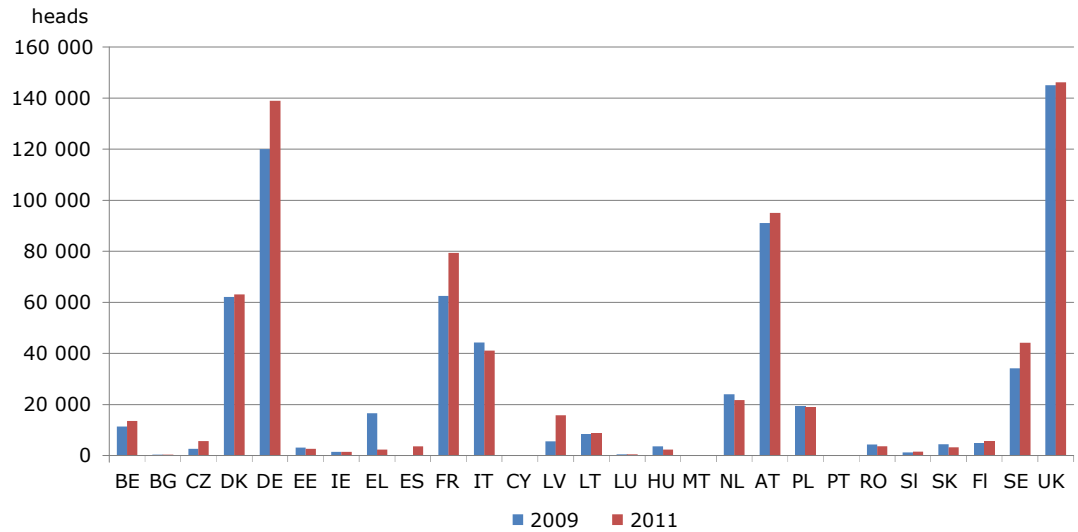
- In France, the largest EU bovine producer (19 mio. heads) only 2% are organic
- The share of this organic sector represents around 3% in the EU-15 and in the EU-N12 in 2011

Source: EU (2013)

Dairy cattle under organic farming in the EU

- 2011: 0.7 million certified organic dairy cows in the EU = 3% of all EU dairy cows (EU-15 = 3.7%; EUN12=1.1%)
- Among the EU-N12 Member States: Latvia = 9.6% of total dairy cow herd, Estonia = 2.7%, Slovakia = 2% and the Czech Republic = 1.5%.
- Member States with largest organic share, according to available data:
  - 1. Austria (18%), 2. Sweden (12.7%), 3.Denmark (10.9%) and the United Kingdom (8.1%).
- For France, second largest EU dairy producer, number of organic dairy cows in the total dairy cow herd stands at 2.1%.

Graph 30. Number of certified dairy cows in the EU in 2009 and 2011 in the EU Member States

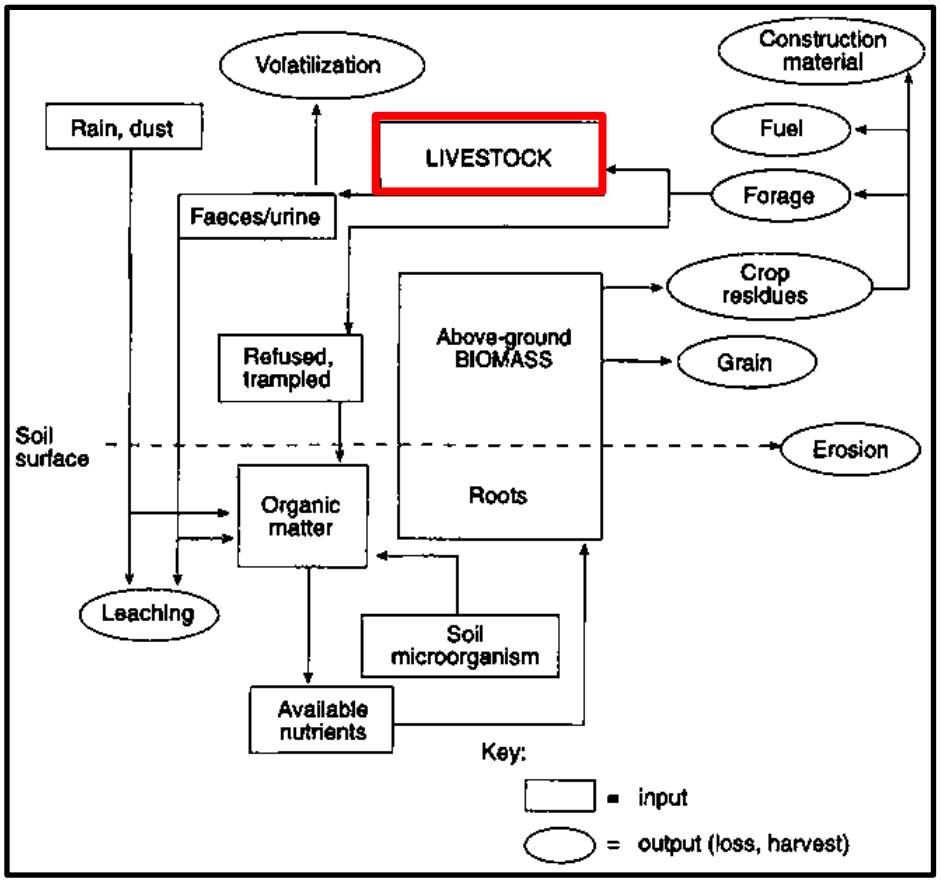


Source: Eurostat data on the basis of Council Regulation (EC) No 834/2007 on organic production (online data code: food_in_porg3). Data for DE from BLE study Strukturdaten im ökologischen Landbau in Deutschland 2011*. Data for AT for 2011 from* Grüner Bericht 2012*. Missing data for CY, MT and PT. Estimated data for BG, IE, LT and SI (2011).*

Source: EU (2013)

Importance of cattle in organic farming

- ruminants play a key role in organic farming due to their ability to convert celluloses (useless for human consumption) into protein riche products (milk, meat) and due to their role in nutrient recycling (soil fertility)
- Economic importance in organic farming (income from sale of animals themselves, beef, sausages, milk, dairy products)



Picture source: Powel and Unger, www. ilri.org

Goals of organic dairy and beef cattle breeding

robust and healthy (tolerates variable environmental conditions)

longevity

fertile (one calf per year)

good mothering - ability (beef cattle)

high uptake of roughage for good milk/ beef yield

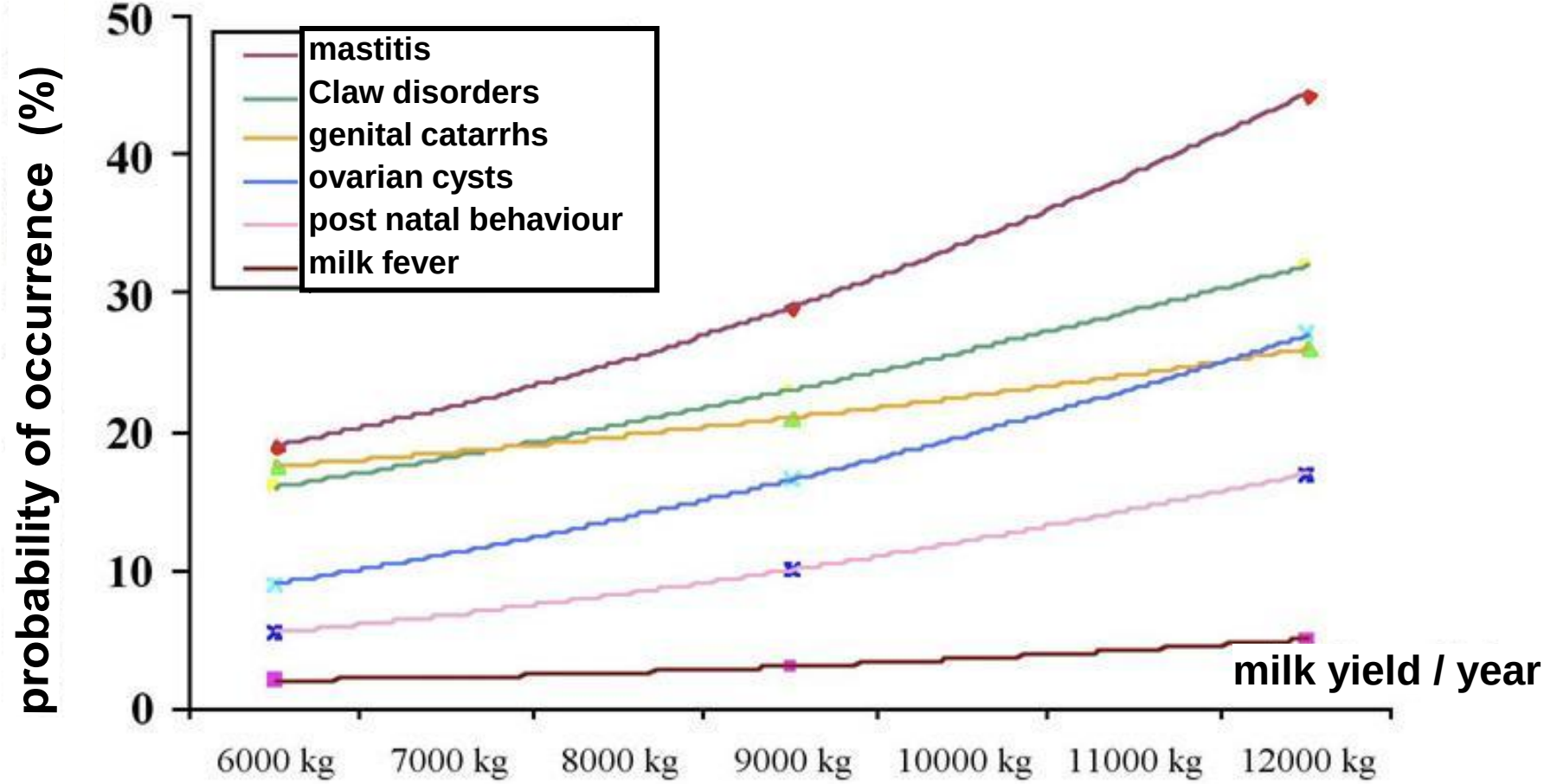
good udder form, healthy udder

hard, healthy claws

dry, appropriately angled hock and pasterns

good persistency throughout lactation

Main challenge in dairy cattle:
– milk yield versus animal wellbeing



Metzner et al., 1996 and Fischer et al., 2001

What do organic cattle farmer try to do?

- Prevention through best practice: How is it done?
  - Chose locally adapted breed/ strains
  - Adapt breeding goal to individual farm conditions (e.g. climate, soil quality → grassland yields, crop production capacity etc.)
  - Meet the animal´s natural requirements with regard to:
    - Social behaviour
    - Feeding
    - Locomotion
    - Comfort behaviour etc.
  - In case animals get ill, cure them in order to avoid suffering (alternative therapies with proofed efficiency are first choice)

Reproduction

Natural requirement

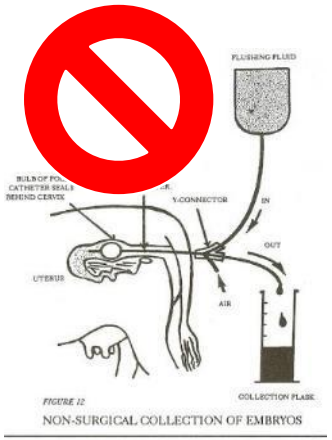
- Natural mating

How to meet the requirement?

- Keep bull in the herd

Status Quo:

- Natural mating to be preferred according to EU regulation
- Artificial insemination (AI) allowed
- ban on embryo transfer in organic farming (prerequisite is hormonal treatment)
- Dairy cattle: AI is the usual reproduction technique, natural mating is seldom
- Beef Cattle: natural mating is common place



Bieber et al., 2014

Animal breeding in organic animal husbandry

- Chose locally adapted species and breeds
- Need of seperate organic breeding program for dairy cattle often proclaimed, but until now not realized, because of small organic population sizes (and therewith high costs)

Genotype x environment interactions

- One argument for the claim are so called genotype x environment interactions
- Assuming their existence the same genotype would have a significant different performance under organic versus conventional management conditions.
- Therewith breeding values derived from data obtained from mostly conventional farms would not be as reliable when applied to organic farms
- Studies on the existence of Gx E interactions in dairy cattle show inconsistent results.

Bieber et al., 2014

Does organic dairy cattle breeding use other breeds and breeding techniques?

- Mostly the same higher yielding breeds are used in organic agriculture with some exceptions where locally adapted breeds are kept
- Dairy cattle: artificial insemination accounts for over 95% of matings → no difference compared to conventional farms
- No organic breeding programs, but in some countries Organic total merit selection indices are established (e.g. for Brown Swiss Cattle in CH, for Fleckvieh in the Bavarian part of Germany (Krogmeier, 2003) and in Austria (Baumung et al. , 2001), but studies on their effectiveness and acceptance are scarce
- Organic total merit selection indices put a higher weight on functional traits than traditional total merit selection indices

Social behaviour

Natural requirement

- Gregarious animals
- Simultanoeus resting and activity intervals
- Individual avoidance distance

How to meet the requirement?

- Loose housing
- One resting place and one feeding place per animal
- Enough space, wide runs

Bieber et al., 2014 11

Feeding behaviour

Natural requirement

- Sucklers
- Food competitors
- Several feeding periods
- grazers

How to meet the requirement?

- Teat buckets or calf rearing with access to its dam
- Feed rack in the barn; 1 place per animal
- Constant feed supply
- easily accessible water troughs
- Access to grassland, feeding on roughage, limited amount of concentrates according to regulations (see lesson 1)

Remark

- Beef: calf rearing with permanent access to dam and other cows is characteristic
- Dairy: calf rearing with temporarily access to dam is scarce, but a topic of increasing interest

Bieber et al., 2014

Locomotion

Natural requirement

- Need for exercise
- Soft ground walkers

How to meet the requirement?

- Loose housing, walking yard
- Access to grazing land
- Runs with solid grounds and partly soft, not slippery walking mats

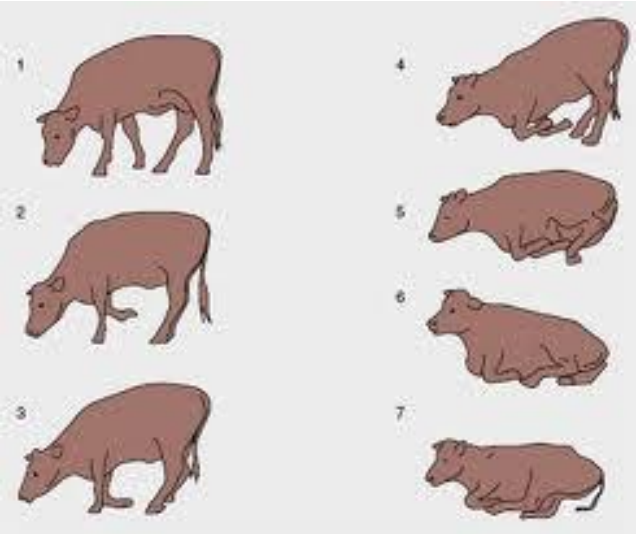
Resting behaviour

Natural requirement

- Resting behaviour
- Several resting periods
- species-specific motion sequence

How to meet the requirement?

- Correctly spaced lying areas
- Soft lying ground (litter)



Motion sequence of cattle
(Source: www.proplanta.de)

Picture source: www.landwirtschaft-bw.info

Comfort behaviour

Natural requirement

› abrasion

› mutual licking

How to meet the requirement?

› Brushes in the barn, trees on grassland

› Loose housing

Picture source: http://www.dradiowissen.de/media/files/4/45321d5549b884ee35826583b5c03bb7v1.jpg

Picture Source: www.delaval.de

Summary	Natural Behaviour / Requirement	Possible implementation in organic farming	remarks
Reproduction	Natural mating	Bull in the herd (recommended according to regulations)	Dairy: AI is common place, natural mating is an exception Beef cattle: natural mating is common place
Social behaviour	• Gregarious animals • Simultanoeus resting and activity intervals • Individual avoidance distance	• Loose housing • One resting place and one feeding place per animal • Enough space, wide runs	
Feeding behaviour	• Sucklers (calves) • Food competitors • Several feeding periods • grazers	• Teat buckets or calf rearing with access to its dam • Feed rack in the barn; 1 place per animal • Constant feed supply • Access to grassland • Roughage , limitation of concentrate	Beef: calf rearing with permanent access to dam and other cows is characteristic Dairy: calf rearing with temporarily access to dam is scarce, but a topic of increasing interest
Locomotion	• Need for exercise • Soft ground walkers	• Loose housing, walking yard • Acess to grazing land • Runs with solid grounds and soft, not slippery walking mats	
Resting behaviour	• Several resting periods • species-specific motion sequence	• Correctly spaced lying areas • Soft lying ground (litter)	
Comfort behaviour	• abrasion • mutual licking	• Brushes in the barn, trees on grassland • Loose housing	

Source: M. Hermle (2010) adapted by A. Bieber

Beef cattle

Extensive/ organic beef production

- Feed: emphasis on GRASSLAND
  - summer : pasture,
  - winter : grass silage & hay, and outdoor run
  - No or little concentrate
- daily gain: 700 to 800g
- Input: low construction costs for barns, little technology input, work load < dairy cattle, low energy input

Intensive beef production

- Feed: less roughage, high amount of corn and concentrates, in barns or feed lots
- daily gains:1000 to 1500g
- Input: high energy input

Meili, E. adapted by A. Bieber, FiBL, 2013

Which breeds for low input organic beef production?

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

↓

Rearing for 6 months on the dairy 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

Breeds – Angus-suckler cow herd with Limousin bull

Breeds: Crossbreed from dairy farm

after 3 weeks with outdoor run

Castration

- safety reasons
- in the first 3 weeks
- no half oxen (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

Principles of husbandry for low input organic 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
- good place for loading
- no pushing or driving with electric device

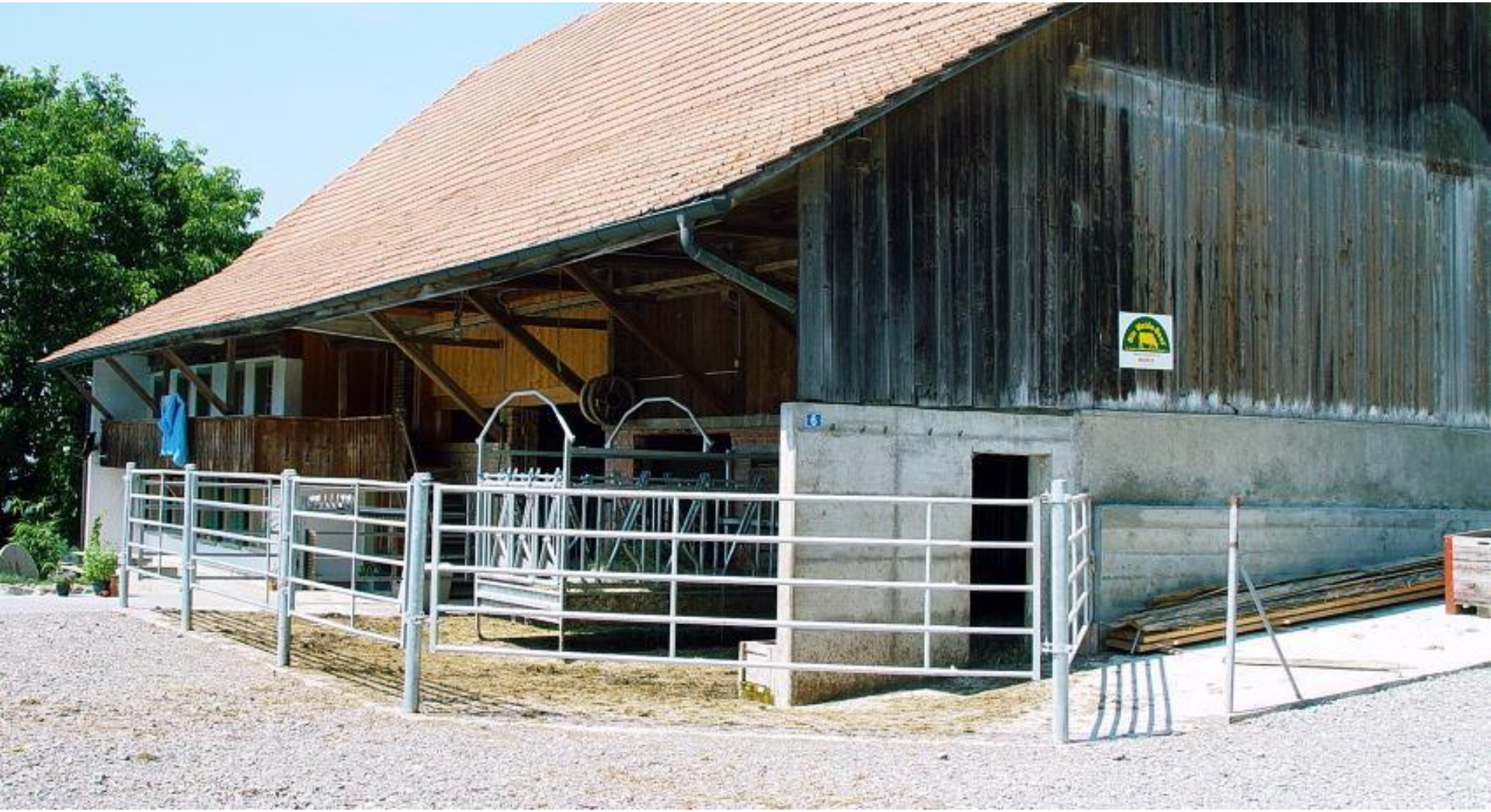
Loading - good ramp facilities important

Barns

- simple – use or rebuild the old barn
- barn design: feeding place leads directly to outdoor run, separate lying place
- division in 2 or 3 groups
- enough space for lying down
- permanently accessible outdoor run
- strong paddock fences
- feeding bars at the feeding place

Barns – feeding bars to separate animals

Barns – paddock fence has to be strong



Barns for suckler cows with fattening of weaners

- keep weaners for fattening in separate groups
- a lot of straw is used up in deep litter systems
- for older animals choose cubicles for lying area
- use enough straw in the lying area

Barns – use enough straw in cubicles

Feeding aims

- proper carcass weight
- proper finishing (fat)
- proper carcass quality
- proper meat quality
- lots of roughage in the ration
- lots of pasture grass (cheap feed)
- low input on concentrated feed (expensive)

Feeding crossbred offspring from dairy cows

- 600 to 900 l milk; temp 37- 38.5 ^{o}C
- dummy at height of calf's head
- continual access to fresh water
- good quality hay
- salt and minerals
- little concentrate
- important
  - weaning two weeks before calf changes the farm
  - no milk with antibiotic residues

Feeding

1. during growth period (age 5- 13 months, 200 to 350 kg live weight)

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

2. between growth & fattening (age 13-20 months, 350 to 475 kg live weight)

- roughage ad libitum
- lower feed quality requirement

3. 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 concentrates necessary
  - oxen up to max. 150 kg of concentrate

Pasturing

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

Overall Summary

- organic cattle husbandry has a relatively low average share of 3% in overall cattle husbandry in the EU
- ruminants play a key role in organic farming due to their ability to convert celluloses (useless for human consumption) into protein riche products (milk, meat) and due to their role in nutrient recycling (soil fertility)
- organic farming aims at keeping animals healthy by using side adapted breeds/ strains and meeting the animal's natural requirements in all aspects of husbandry

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