

3.3 Denmark (Mette Vaarst, Anne Braad Kudahl)



The majority of the milk in Denmark is produced in Jutland, the western part of the country. The holdings are basically family farms with one or two employees. More than 90% of the milk is produced by specialised dairy farms. The roughage is mainly grass and maize silage produced at the farm in a rotation with cereal crops. Thus the grass area is typically a two year ley and the share of cereal is around 20% of total land use. Almost all farms practise all year round calving. Less than 1/3 of the conventional dairy herds practise grazing (for cows). The most common breeds are Danish-Holstein (73%) followed by Jersey (12%).

Approximately 10 % of the dairy farms practise organic farming. The organic dairy farms are typically slightly larger than the conventional farms in terms of cows per herd and have a lower stocking rate, thus managing more land. The milk production per cow is approximately 10% lower in organic than in conventional systems (8400 versus 9200 kg milk for heavy breeds). The typical land use on organic farms consists of a higher share of grass (primarily clover/ grass at a rate of 50-60% in the rotation) at the expense of maize and cereal crops. In both organic and conventional production, automatic milking systems (milking robots) are extensively used. 30% of the domestic liquid consumption is organic milk (a large proportion of the conventional milk is manufactured into cheese and butter for export).

3.3.1 Characteristics of the case study farms

The ten Danish farms which took part in the rapid sustainability assessment were selected by the Thise Dairy Company project manager in collaboration with the research partner, from the 87 organic milk suppliers to the company. The Thise Dairy is a cooperative dairy owned by the suppliers, who are mainly situated in the middle, western, and northern part of Jutland. Averages describing the Thise Dairy supplier group are not available; based on the available information we consider Thise Dairy suppliers to be generally representative of organic dairy herds in Denmark. Column one in Table 5 describes averages of all organic dairy farms in Denmark split into larger breeds and Jerseys.

Table 5 Characteristics of Danish organic dairy farms and farms selected for assessment

		Mean of all organic dairy farms in Denmark (Danish Cattle Federation, 2009)	Mean of farms selected	Range of farms selected
Farm size	ha	188 ^a /124 ^b	229	56-357
Herd size	No. of adult cows	138 ^a /133 ^b	161	36-480
Stocking rate	Livestock units/ha	Unknown	0.98	0.60-1.85
	Grazing livestock units/forage ha	Unknown	1.51	0.95 – 2.26
Milk sales	l/cow/year	8099 ^a /7515 ^b	6453	4554-8750
Level of concentrate fed to milking animals	kg/cow/year	Unknown	Unknown	Unknown
Total purchased concentrate per cow ¹	kg/ cow/year	Unknown	1110	4 - 2920
Milking cows per Annual Labour Unit	Milking cows per Annual Labour Unit	Unknown	72	36 - 105
Labour input per unit area	Annual labour units/100 ha	Unknown	1.19	0.57 – 2.31

¹Data from the tool - may include some concentrate fed to other livestock on the farm, therefore not necessarily directly comparable with the line above

^a Large breeds

^b Jersey

Farms were selected so that they represented the widest possible range of dairy producers within the Thise dairy company. The main criterion was large variation between farms, in terms of size of herd and farm, breed, geographical location. In addition, farmers should of course be willing to participate in the project. Some farms were partly chosen because of special characteristics, such as a farm shop and ice cream production, or special interest in and activities around nature conservation. Most farms specialized in milk production, but a few of them had some innovative characteristics, mentioned below, and special crop rotation systems.

For most of the participating farms, the activities and enterprises on the farm were centred on milk production. There are few multi-functional farms. Unusual or interesting practices were seasonal calving, keeping calves with suckler “aunts”, and trying to feed with large amounts of hay instead of silage (there have been projects on this in Thise, because they sell special ‘hay cheese’; the challenge is the huge amounts of electricity / diesel used to dry the hay under Danish weather conditions).

With regards to novel forages, a few farms in Thise (one among the interviewed farmers in this project) used herb mixtures in the grass to promote health and biodiversity.

The farms had been organic for between 12 and 28 years (mean 16). The selected 10 organic farms had a little more land area and larger herd than the average Danish organic dairy farm but covered a wide range. The average milk yield was somewhat lower on the ten farms than on organic farms in general. Some of the 10 farmers explained that they had an intentional low-input-low-output-low-stress-level-of-cows-strategy to keep the disease level low in the herd. This type of farming strategy might be over-represented among the 10 farms, because we deliberately chose for differences between farms. The share of Jersey herds is also over-represented compared to Danish organic dairy herds in general, where about 10% of the herds are Jersey herds and the remainder use larger breeds, mainly Danish Holstein. That also contributes to a lower average milk yield among the 10 project herds compared to organic farms in general.

The project herds were specialized milk-producers selling all their milk to the Thise-Dairy, they were more or less self-sufficient in feed, and a few had other niche products.

The average number of cows per ALU was the highest within the project countries at 72, with a low labour use of only 1.19 ALU/100 ha. The proportion of permanent pasture was low at 12% on average.

3.3.2 Results of the sustainability assessment

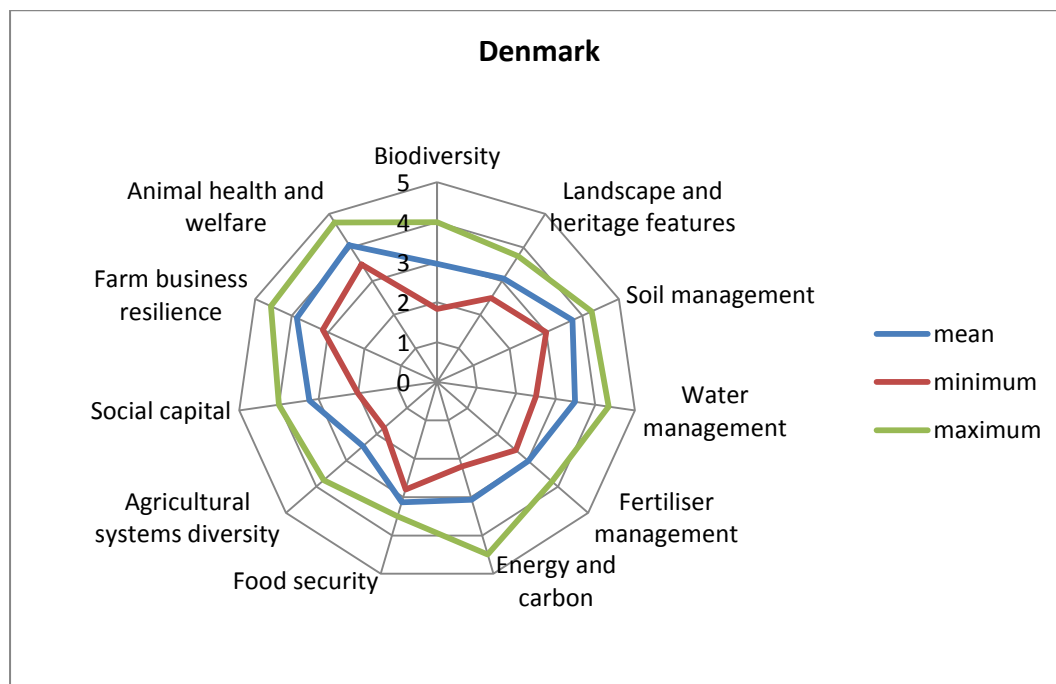


Figure 6 Spur diagram for Denmark

A wide range of responses was observed within the spurs across the Danish farms (Figure 6). The largest variation between farms occurred in “Biodiversity”, “Energy and Carbon”, and “Agricultural Systems Diversity”. Relatively high scores (>3.5) were assigned to “Animal Health and Welfare”, “Farm Business Resilience”, “Soil Management and Water Management”. Relatively low scores were

assigned, in particular, to “Agricultural Systems Diversity” and “Biodiversity”. Danish dairy farms are in general highly specialized and characterised by intensive land use and herd management. The plans mentioned in the rapid sustainability assessment tool (Biodiversity Action Plan and ‘Sites of Importance for Nature Conservation’) are not well known in Denmark. Instead most of these sites are protected by national laws, which prevent alteration of all meadows, saline meadows, dry hilly grasslands, heaths, moors, bogs and lakes larger than 100 m². The share of these protected farming areas varies across Denmark which is reflected in the variation in biodiversity score. Also the score for “Water Management” is elevated by the fact that since 1987 Denmark has implemented more and more strict laws (“Water protection plans”) protecting both drinking water and surface water (water courses, lakes, fiords and the sea) from contamination with N, P and pesticides. During these years the use of artificial fertilizers has been reduced by 50%. N balance had a mean value of 99kg/ha (range of 13 to 182), P balance -2.2 kg/ha (- 18 to 3.8) and K balance 9.6 (-75 to 48) kg/ha. The median N balance figure is comparable with those from the study of Oudshoorn et al (2012) of 110 and 66 kg N/ha for nine Danish organic farms with and without automatic milking systems respectively.

All ten farms scored maximum points for the following individual “activities” within spurs (Figure 7): agri-environmental participation, crop protection and pesticides (organic farms, no pesticide use), erosion (Denmark is flat, shelterbelts stop wind erosion), fertilizer management (no artificial fertilizer used), third party endorsement (all are members of the cooperative dairy which has received several prizes for its dairy products), food quality certification (all certified organic producers), and information seeking/networking (without being dynamic and forward thinking farmers cannot stay in business).

Low scores (around 1) were found for genetic heritage (rare breeds are very rare in Denmark, and heritage crops were not grown by any of the ten farmers, although they are grown elsewhere in DK), benchmarking energy and carbon (energy and especially fuel use is very high in DK), Local food (milk from These Dairy is sold all across Denmark, most animals are slaughtered at big slaughterhouses distributing meat nationally, only few animals are slaughtered and sold locally, and one farm produced and sold its own ice cream), on-farm-processing (uncommon in DK, requires certification of factory-like processing facilities with high hygiene standards), employment (often only very few people work on the farm – technology has taken over many tasks that previously required manpower).

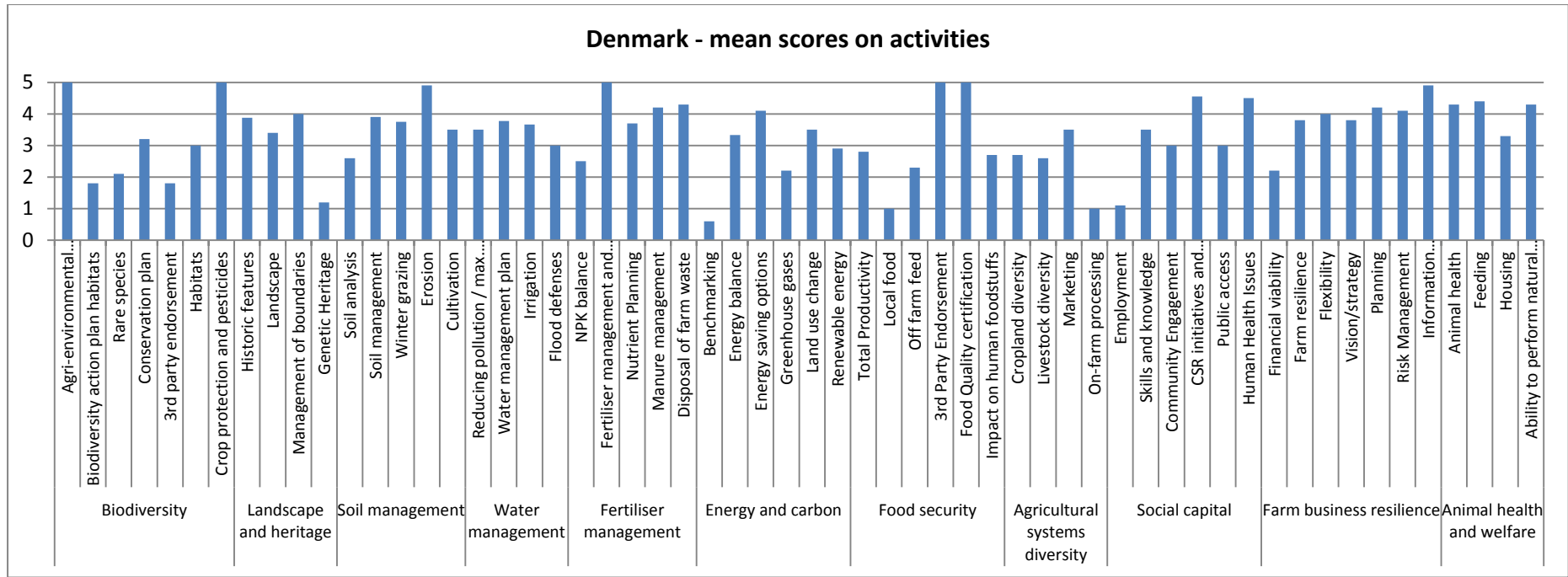


Figure 7 Mean scores on activities for Denmark