KNOWLEDGE – GROWTH – BALANCE

Danish Agriculture & Food Council, Cattle

WORLD CLASS Cattle Production

Danish Agriculture & Food Council

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Editor	Søren Mejrup Jensen, Danish Agriculture & Food Council, Cattle
Layout	Inger Camilla Fabricius, Knowledge Center for Agriculture, Cattle
Translation	Stewart Grant, SGConsult
Graphics	Christian E. Christensen, Knowledge Center for Agriculture, Cattle
Cover photo	Jens Tønnesen, LandbrugsMedierne
Publisher	Danish Agriculture & Food Council, Cattle
Edition	1st edition
Printed by	GP Tryk Grenaa
Number of copies	1.000
Web edition	www.vfl.dk/kvaeg
	February 2013
ISBN	978-87-91566-86-8
Website ISBN	978-87-91566-87-5

Photo: Torben Worsøe, LM

World class cattle production

The Danish cattle sector has a strong global position and the sector is of great significance to Danish society. The cattle sector provides 46,500 jobs and gives an annual turnover of Euro 7.5 billion with a total export value of Euro 2.7 billion. The agriculture sector overall accounts for an export of Euro 16.8 billion and employs 140,000 persons.

Danish cattle farms are among the very best in the world when it comes to environmental and climate friendly production of dairy and meat products. At the same time modern cattle housing systems and professional management contribute to a high level of animal welfare on Danish cattle farms, seen in an international perspective.

Cattle production, given the right framework conditions, will continue to contribute significantly to the growth and development of Danish society.

Danish dairy farmers, in 2015, will no longer be subjected to EU quotas on milk production. This is expected to result in a greater production of milk and thus more jobs and increased export earnings.

This booklet provides an overview of the Danish cattle sector and gives answers to a series of questions about the sector.

Facts about danish cattle production

- There are currently about 18,000 farms with cattle production in Denmark.
- Cattle production is moving west – with more than 85 % of all cows being found, today, in Jutland.
- The Danish cattle herd consists of about 1.6 million head of cattle, of which 580,000 are dairy cows, 670,000 heifers and 270,000 steers and bulls. There are also about 100,000 suckler cows (beef cattle breeds).
- The 3,700 dairy farms in Denmark supply in total as much milk as 141,000 herds did 50 years ago. And the trend towards fewer but larger herds continues.
- A cow produces on average 25 litres of milk per day, compared with 12 litres per day 50 years ago. The highest yielding cows give about 40 litres of milk per day.
- An average herd consists of 156 cows, compared with nine cows 50 years ago. Jersey herds remain the largest with an average of 165 cows.
- The largest herd has about 1,600 cows. There are more than 40 herds with over 500 cows.
- An average herd produces 1.4 million litres of milk annually. 50% of dairy farms produce over 1 million litres of milk annually.
- There are more than 100 large specialised producers of veal calves in Denmark, each producing more than 300 calves annually. The farmers buy bull calves from dairy herds for fattening. The veal calves are slaughtered when they are between 9 and 10 months old.

Photo: Maersk Line

Cattle production – a valuable contribution to danish economy

Danish cattle farms provide 46,500 jobs in the food sector (equivalent to about a third of total employment in the food sector). Cattle production thus contributes significantly to the national economy.

A typical dairy cattle farm with 150 cows is estimated to give a tax base equivalent to six public employees. The farm provides work for about nine persons (in primary production, processing and other jobs derived from agriculture) and is estimated to provide an export of about Euro 470,000.

85 % of Danish milk producers and half of all jobs in the dairy industry are located in rural areas where there is a need for local jobs. Cattle production plays an important role in the positive economic development of all regions of Denmark.

Exports of dairy products and beef are estimated to be about Euro 2.7 billion in 2012, with about Euro 2.3 billion from dairy products and about Euro 400 million from beef and live animals. Spending by the Danish state on early retirement schemes, more than Euro 2.9 billion in 2012, is almost equivalent to the export value of dairy and beef products.

The largest export markets for dairy products are Germany (cheese), UK (butter and cheese) and Sweden (butter and cheese).

The largest export markets for beef and veal are Germany, Italy and Spain.

About two thirds of total cattle production is exported.

Animal welfare – a focus area

Cattle producers have spent many years working very hard to improve animal welfare and to minimize the impact on the environment, nature and climate. It is clearly expressed in the vision by the Danish Agriculture & Food Council, Cattle from 2009:

"*Danish cattle farms are competitive in a global market and deliver high value products – both conventional and organic, that meet market demands.*

The Danish cattle farming sector is an economically viable sector that creates value through the production of high quality food products, with attention to animal welfare while minimizing the impact on the environment, nature and climate.

Danish cattle farms provide an attractive workplace with development opportunities and challenges."

Cattle producers will also have a focus on animal welfare in the future. Therefore, the sector has set the following ambitious targets for 2013:

- Cow mortality is to be reduced from 5.7 % in 2008 to 3.5 %.
- Calf mortality is to be reduced from 8.6 % in 2006 to 5.5 %.
- The frequency of hoof related disorders is to be reduced by 50% compared to 2008.
- Dairy herds with salmonella level 2 or 3 are to be phased out by 2016 at the latest.
- The proportion of herds, participating in the Operation Paratuberculosis programme, that have implemented an effective action plan is to increase from 25 % to 75 %.
- The treatment requirement for start up mastitis treatment is to be reduced by 10 percentage points, and post treatment reduced by 20 percentage points.
- The average tank somatic cell count on a national basis is to be reduced to less than 220,000 (indication of udder health).

Danish cows have more housing space compared to other countries

In many ways there are more stringent requirements to animal welfare in Denmark than in the rest of the EU.

A new law for dairy cattle production came into force in Denmark on the 1st July 2010. The law will be phased in over the coming years and includes a wide range of requirements for animal welfare in Denmark, which will not be applicable in the rest of the EU.

Cattle housing constructed after the 1st July 2010 must meet all requirements of the new law. For cattle housing constructed before this date requirements are to be met during a transition period.

The most important areas of the law are:

- Requirements for a minimal area per cow and per young animal, and for the length and width of cubicles and widths of passageways.
- Requirements in the housing design for a separate calving area , and a separate area for sick animals.
- Requirements for hoof care.
- Requirement for the availability for hide care
  - for example rotating brushes.
- Requirement for additional feeding space for cows that have just calved.
- Ban on tethered cattle housing.

Furthermore the farmer will be required to carry out a self-inspection programme for animal welfare to ensure that the farmer knows and complies with the animal welfare legislation.

Photo: Archive image

World class food safety

- Beef production in Denmark is characterised by a very low usage of medicine compared to other countries. The Danish model in general is highlighted by the EU in efforts to reduce the use of antibiotics in agriculture.
- In Denmark a record is kept of how much antibiotic is given to each animal. This is unique by international standards and means that Denmark is at the front in the fight against the development of resistant bacteria.
- In Denmark there is particular focus on 'critical antibiotics', those that are most likely to lead to the development of resistant bacteria. As a result the use of 'critical antibiotics' for mastitis control has been more than halved in recent years.
- Danish beef can always be traced back to the farm where the animal was raised. All animals have an 11-digit earmark. The first six digits indicate where the animal was born, and the last five digits are the specific number of the individual animal. Earmarking ensures full traceability throughout the food chain from farm to table. The animal carries the same ear tag throughout its life.
- Danish cattle have the best health status in the world because they are officially free from serious diseases such as tuberculosis, brucellosis (infectious disease) and leucosis (tumour disease).
- Denmark is one of a few countries officially classified as having a negligible risk for BSE (mad cow disease).
- Danish beef is the guarantee of a high food safety. This is due to a high level of health and hygiene control throughout the complete production cycle, limited use of medicines and a high degree of safety regarding feed.
- Hormones and other artificial muscle-building drugs have never been used in meat production in Denmark.

Milk quality at its best

All dairies have a quality control programme for food safety, animal welfare, environmental considerations and milk composition. Quality control programmes cover all legal requirements and additional requirements and recommendations set by the individual dairy.

- Milk has a natural composition of fat, protein, minerals and other important components.
- Milk from sick cows and milk with visible changes may not be delivered to the dairy. The milk from each cow is tested before each milking.
- Danish milk producers have a constant focus on improving milk quality and reducing medicine use.
- Improvement in udder health continues and the somatic cell count has almost been halved over the last 25 years. Cell count is an indication of the health of the udder, the lower the cell count the better the health of the udder.
- Hygiene related to cattle housing and the milking process continues to improve (the bacterial count continues to decrease).
- The hygienic quality of Danish milk is world class, and yet the sector is continually working to further reduce the bacterial count.
- All milk is pasteurised (heat treated) so that it is free from bacteria, yet the taste is retained.
- A dairy farmer can always request assistance from milk sector advisers for expert advice on handling the milk from the cow to the milk tank.

The green conversion is in full progress

Agriculture has over many years invested, worked on and carried out research towards an increasingly sustainable production. This effort has yielded tangible results. Danish agriculture is simply among the very best in the world when it comes to minimal impact on the environment and climate change per unit of production.

- From 1990 to 2010 the emissions of greenhouse gases were reduced by 24 % and the loss of ammonia by 37 %. From 1990 to 2011 the nitrogen surplus declined by 47 % and the phosphorus surplus declined by 115 %. During the same period, agricultural production increased by 21 %. Agriculture continues to produce more with a continual reduction of the environmental impact per unit produced (see graph).

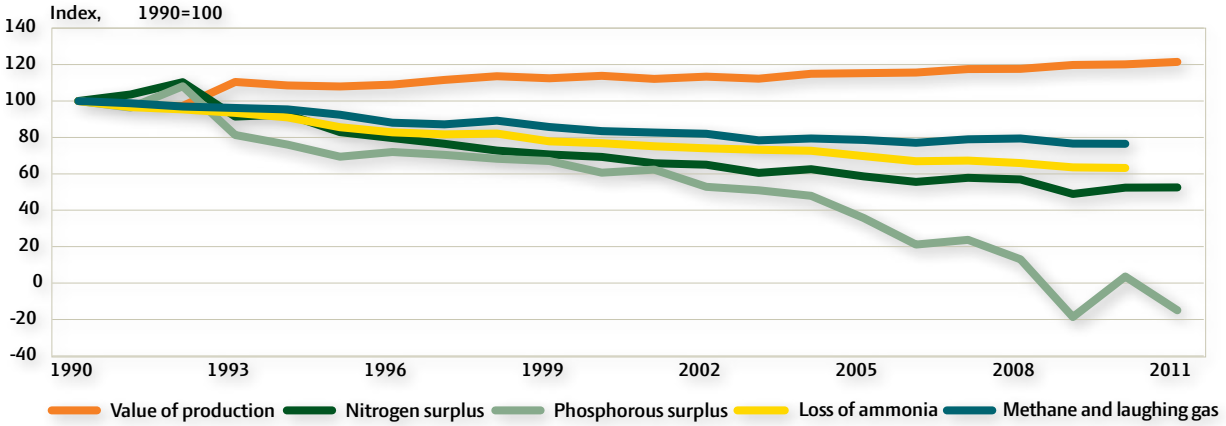
The readjustment, to more environmental and climate friendly production systems, has occurred through:

- Development of new products. Dairies and meat processors, in collaboration with producers, have developed a number of new products in response to the demand from consumers for more environmentally and climate-friendly products.

- Significant improvement in animal welfare. Hundreds of millions of Euro have been invested in approximately 3.500 new cattle housing units since 1990. The result is that about 85 % of all Danish dairy cows now walk freely in some of the most modern cattle housing systems in the world.

- Environmentally efficient cattle housing systems. New housing systems have provided the opportunity for the introduction of modern feeding systems, robot scrapers, floor systems, air cleaners, etc. which has contributed significantly to reducing emissions to the environment per unit of production.

- Contribution to nature conservation. Thousands of cattle annually graze valuable nature reserves and other protected areas. Here the greatest threat to biodiversity is a lack of maintenance and overgrowth.



Sources: DCE: Landovervågningsoplande 2011 og Danish Emission Inventory for Agriculture. NERI Technical Report no. 810. 2011. Danmarks Statistik: Landbrug 2010 og Nationalregnskabet. EEA: Central Data Repository Submission March 15 2011, for 1990-2009 og cdr.eionet.europa.eu/dk.

Danish cattle producers lower the impact on the environment

Cattle producers have, over the period 1990-2010, almost phased out the use of mineral feed phosphate, which is a limited resource.

The loss of ammonia to the surrounding countryside has also fallen dramatically. As mentioned earlier, the loss of ammonia from agriculture has been reduced by 37 % since 1990.

The cattle sector alone has reduced the loss of ammonia by 48 % since 1985. This is partly due to a decline in the dairy herd from nearly 900,000 dairy cows in 1985 to approximately 580,000 dairy cows in 2012.

Improved breeding, feed optimization, improved crop varieties, improved cultivation techniques and improved slurry management have also resulted in a lower impact on the environment per unit of production. Therefore the total impact of animal manure on the environment has been reduced.

Every time a new cattle house is opened and every time a housing unit is upgraded the design must be based on the best available technology with far lower emissions of nitrogen.

This means that emissions of nitrogen from cattle housing units to the environment are reduced annually, year after year.

Danish cows are some of the most climate friendly in the world

- Total greenhouse gas emissions from agriculture fell by 24 % during the period 1990 to 2010. Increased use of animal manure in biogas production could reduce emissions further.

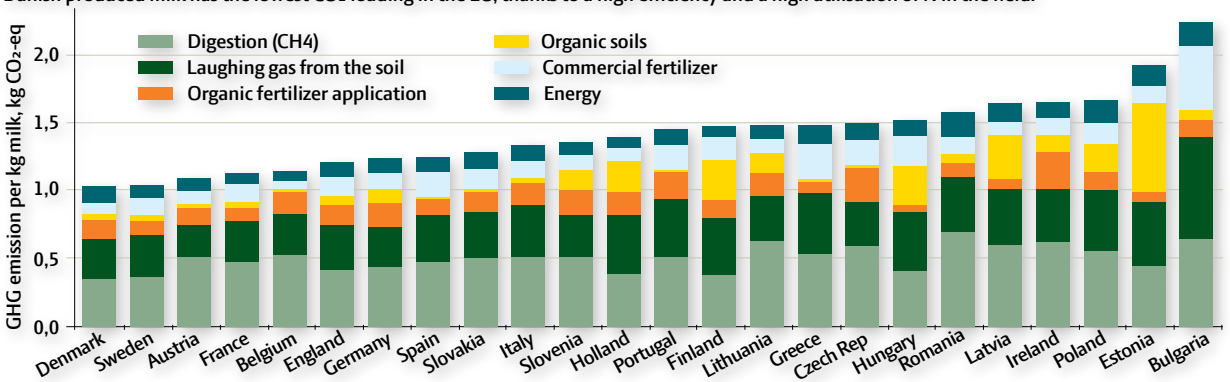
- Danish cattle producers are among the producers in the world that emit the lowest levels of greenhouse gas per litre milk and per kilogramme meat. Milk produced in Denmark has one of the lowest CO_2 loads in the EU. This is not least due to the fact that Danish cows are among the very best in the world when it comes to converting feed to milk and meat. Furthermore there are stringent requirements in Denmark regarding the storage and use of animal manure for crop production.

- The Cattle industry is continually working to further reduce the impact on the climate. Denmark together with the other Nordic countries will spend about Euro 10 million in the coming years on a number of research projects to raise the feed efficiency further. This will result in more milk per kilo feed and a lower impact on the climate per litre milk produced.

- The results of these projects will be immediately implemented in the feed planning programme NorFor, which is currently used by 60 % of all Danish dairy herds.

- The impact of food production on the climate cannot be compared kilo to kilo. Climate load should always be related to the energy and nutrients the food provides. One kilo of fruit and vegetables contributes far less energy and protein than one kilo of meat. If our daily energy needs were to be covered by fruit and vegetables only we would need to eat much more fruit and vegetables than we do today. And the requirements for a number of vitamins and minerals, such as iron, would not be met.

Danish produced milk has the lowest CO_2 loading in the EU, thanks to a high efficiency and a high utilisation of N in the field.



Source: J.P. Lesschen et al. / Animal Feed Science and Technology 166-167 (2011), 16-28.

Organic and conventional milk production

Danish consumers today demand many different types of milk, such as, milk with different levels of fat content, milk with or without lactose, milk from specific breeds and organic milk.

Organic milk production now accounts for almost 30 litres in every 100 litres of milk sold in Denmark.

- Arla Foods is the largest producer of dairy products from organic production in the world.
- 50 % of all Danish school milk is from organic production.
- There are 400 organic dairy farms in Denmark.
- Germany is the only country in the EU that has a higher production of organic milk than Denmark.
- Dairies expect a growth in exports of organic dairy products in the future, especially to Germany and China. Arla Foods will start to ship long life organic milk from Denmark to China in the spring of 2013.
- Each spring when cows on organic farms are turned out to grass has become a day of celebration. 140,000 people visited organic farms in 2012 when they let the cows out in the spring.

Cattle play a major role in nature conservation

Every day Danish farmers are involved in the care and maintenance of the Danish countryside. Thousands of cows, sheep and goats graze valuable nature reserves and other protected areas in order to promote and maintain the biodiversity of the animal and plant populations in the countryside. Particularly cattle play a significant role in the conservation of the Danish countryside:

- Approximately 350,000 acres, or eight % of the Danish countryside, are protected as particularly valuable nature reserves under the Nature Protection Act.

- Typically it is the open habitats such as meadows, marshes, grasslands, heaths and bogs that have a high biological diversity of animals and plants that are protected.

- Nature reserves are dependent on care and maintenance to remain open habitats and thereby maintain a large biodiversity – either by grazing animals or mechanised mowing.

- If natural areas are not maintained they become overgrown by dominant species resulting in a reduced biodiversity over time. Overgrowth and lack of care and maintenance are the biggest threats to the open habitats in Denmark today.

- Many nature reserves are now being grazed by beef cattle, which are robust animals suitable for grazing both wetland and dryland reserves. But dairy cattle and young stock are also used for grazing protected areas today.

- It is estimated that almost half of all protected areas are either not maintained or are poorly maintained. The Danish Agriculture & Food Council works persistently for the promotion of nature conservation as a regular production service in line with other agricultural activities.

  This will benefit biodiversity, promote the grazing of increased numbers of animals and perhaps eventually really assist in boosting the production of meat from animals grazing protected lands.

Photo: Lely

Denmark is at the forefront of technical development

Danish cattle farmers have a long tradition of farmer-driven innovation and technology development. Therefore modern technology is adopted in all stages of milk and beef production systems in Denmark today. Danish cattle farmers are at the forefront of global development in a number of areas:

Digital claw recording

A programme for electronic recording of claw disorders in cattle has led to the registration of more than one million trimmed hooves in about 1,500 Danish herds spread over 2 ½ years. The programme has been co-owned by Sweden, Finland (FABA), Norway and Denmark since 2012. Several other countries have also shown an interest in the programme. The claw recording programme is a powerful tool in managing claw disorders in the herd.

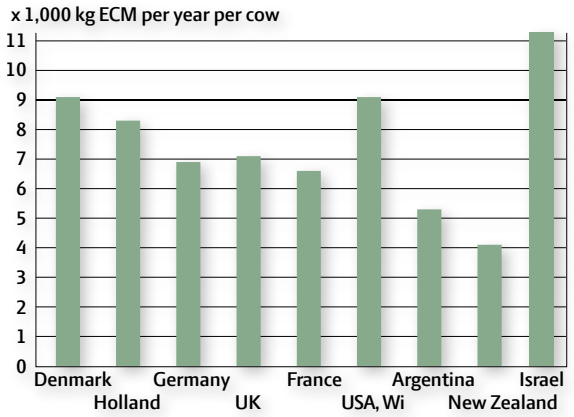
Floor systems with fully automatic manure scrapers

New modern floor systems with high animal welfare and hygiene standards are based on the use of technical solutions that meet the requirements for pollution control through the use of Best Available Technology (BAT). Furthermore, there is an ongoing development of fully automatic manure scrapers that can quickly clean the passageways, while taking animal welfare into account. Manure scrapers have a high environmental impact and make it possible for many milk producers to retain slatted floors, which is an advantage for hoof health.

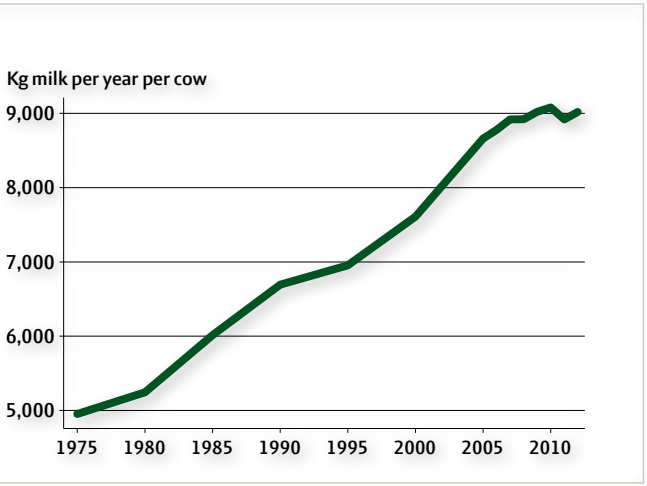
Targeted breeding

Since the early 1980's Danish breeding work has been based on a balanced breeding target called NTM, which focuses both on production and cow health. NTM includes production yield, udder health, fertility, calving and, today, hoof health. Efforts are being made to include the cow's energy efficiency in the breeding programme. An effective breeding plan with intensive use of genomic selection increases genetic progress. A number of countries are in the process of adopting the system.

Efficient milk producers



As regards milk production Danish cows are up among the very highest yielding cows in the world. A Danish cow produces on average about 9,000 kilo milk annually – some dairy cows yield considerably more. The top yielding cows are from Israel and produce about 11.000 kilo milk annually, while the figures from USA are equivalent to the Danish statistics.



A long time effort over many years with selective breeding and improved management has resulted in the yields from Danish cows almost doubling since the mid-1970s. In other words, only half as many cows today can produce the same amount of milk as 35 years ago.

Meat in the Danish diet

Meat and meat products are foodstuffs with good nutritional value. They provide protein of high value and a number of essential vitamins and minerals. It is therefore important to ensure that lean meat is a natural component of a healthy and balanced diet.

Meat contributes to the daily diet of Danes with 10 % of energy and 25 % of protein requirements. In addition meat contributes about 30 % B12, vitamin A, B1 and zinc and about 20 % selenium, niacin, vitamin D and iron. It is important to select lean meat as meat also contributes fats and saturated fats to the diet.

Lean meat is meat that contains less than 10 grams fat per 100 grams of raw meat. Lean meat has high protein content, it is filling and increases metabolic activity.

Adult Danes consume an average of 109 grams of meat and meat products (beef and pork) per day with men consuming about 30 % more than women. This corresponds to about 51 kg for men and about 30 kg for women on an annual basis. Beef and veal account for about 30 % of the meat Danes eat.

There are no official recommendations for meat, but it is considered appropriate that adults consume 100 grams of meat and poultry per day i.e. prepared meat without bones. The amount consumed by Danes today is thereby close to what is considered appropriate.

Milk and milk products in the Danish diet

Milk

Every Dane drinks on average about 90 litres of milk a year – more than half being low-fat products such as skimmed milk, minimilk or buttermilk. In addition Danes consume about seven kg cream and about 13 kg yoghurt per person per year.

Dairy products contribute 10 % of energy and 17 % of protein requirements to the daily dietary requirements of the Danes.

In addition milk products contribute about 30 % of requirements for vitamins B2 and B12, phosphorus and iodine and 40 % of calcium requirements.

The official recommendation is 500 ml of milk a day which is appropriate for most Danes or 250 ml if one consumes a varied diet in accordance with recommendations.

Cheese

Danes consumes an average of 16 kg of cheese per person per year. Cheese contributes five % of the energy and 10 % of the protein requirements to the Danish diet.

Cheese can be seen as a form of concentrated milk, and therefore cheese contains all the good nutrients of milk. On average 10 litres of milk are required for the production of one kilo of cheese.

Presently more cheese is exported to France than imported from France. Germany is by far the largest market for Danish cheese.

Danish dairies produce 500 different cheeses and 300 different milk-based drinks. Exports of cheese amounted to just over Euro 1.1 billion in 2011.

Danish cheeses have repeatedly won awards for being the best in the world.

The Dairy Board of the Danish Agriculture & Food Council has created the website maelken.dk to strengthen the knowledge of milk and milk products and their importance in the Danish food culture.

Development potential – up to 2020

EU milk quotas will disappear in 2015. This can lead to an increase in the production of milk and beef in the coming years.

The Danish farm structure is better than in many other EU countries. The Danish dairy herds are the largest in the EU, and Danish dairy farmers are generally younger than their foreign colleagues. Moreover, in recent years, hundreds of millions of Euro have been invested in approximately 3,500 new cattle housing units.

At the same time, the numbers of affluent middle class consumers will more than double globally from the present level by 2020. In Asia alone (primarily China) the middle class will increase by more than one billion by 2020.This development will increase the demand for dairy and beef products.

Danish milk products and Danish beef are produced with a lower impact on the environment and climate than other countries. Therefore the Danish cattle sector will be well positioned to increase production through intensive sustainable production.

If the food production sector can maintain its share of the present markets exports could increase by Euro 5 billion to Euro 21 billion over the coming four-five years. This will give income to farmers and society, and create thousands of extra jobs. This requires, however, that the sector is permitted to increase production, of, for example, milk and beef.

Danish Agriculture & Food Council, Cattle

Agro Food Park 15
Skejby, 8200 Aarhus N

T +45 8740 5000
F +45 8740 5010

W www.vfl.dk

Danish Agriculture & Food Council

Axelborg, Axeltorv 3
1609 Copenhagen V

T +45 3339 4000
F +45 3339 4141

E info@lf.dk
W www.lf.dk