Farming and milk production in Denmark

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In recent years the structural development within dairy farming in Denmark has been substantial. Within the latest ten years the number of dairy farms has been reduced by more than 50 per cent and the number of dairy cows per herd has doubled to approx. 110 cows per herd – Europe's largest.

Herd size and milk yield up

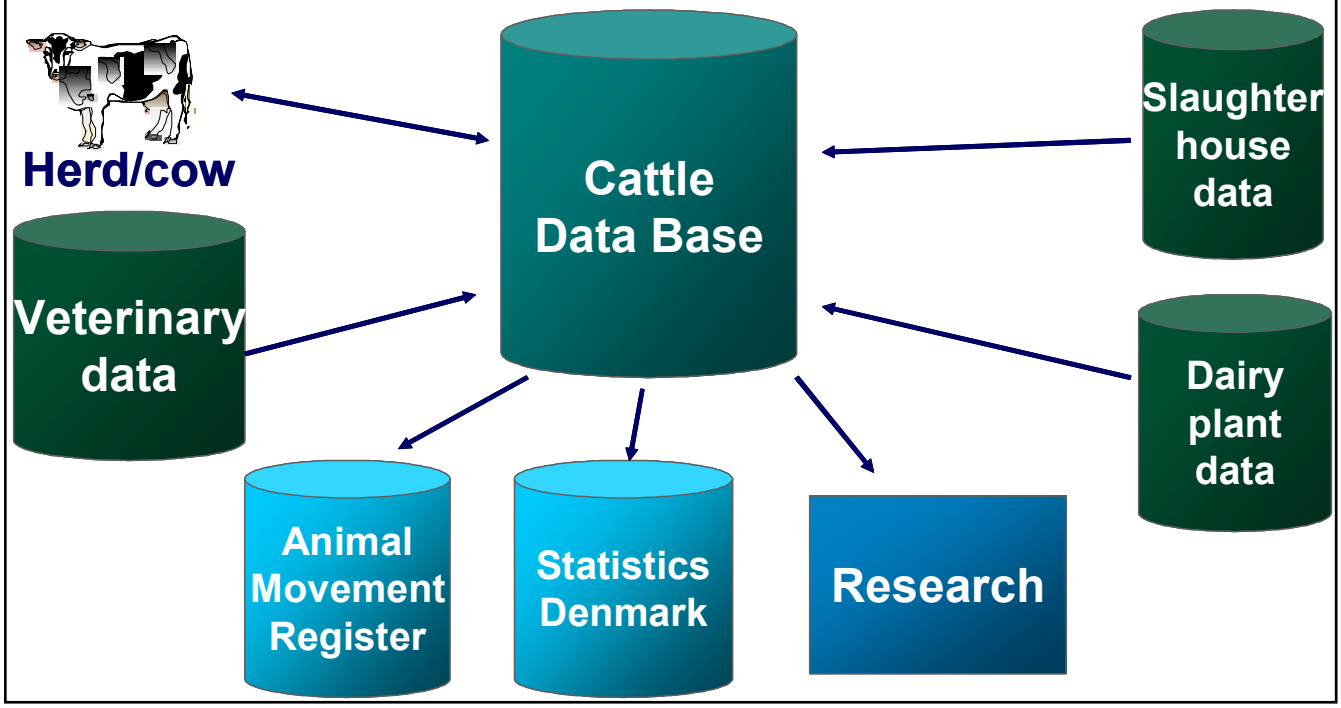
As member of the EU we have a national, fixed milk quota. Due to efficient breeding programs and excellent management the average milk production per cow still goes up, up, up… Because of the national milk quota and increasing milk yield per cow the number of dairy cows is declining. Right now the number is 475,000 cows and Holstein is the predominant dairy breed – 72 per cent Holstein; 12 per cent Jersey; 8 per cent Danish Red; 1 per cent Red Holstein; 7 per cent crossbreds. The average milk recorded yield of all breeds is 8,800 kg – an increase of 24 per cent compared to 1990.

We expect this development to continue. Before 2015 2.5 billion kg milk quota has been turned over to those who want to stay in business. In 2015 the average dairy farm has 160 cows, may be more, and the average milk yield per cow is predicted to 10,300 kg.

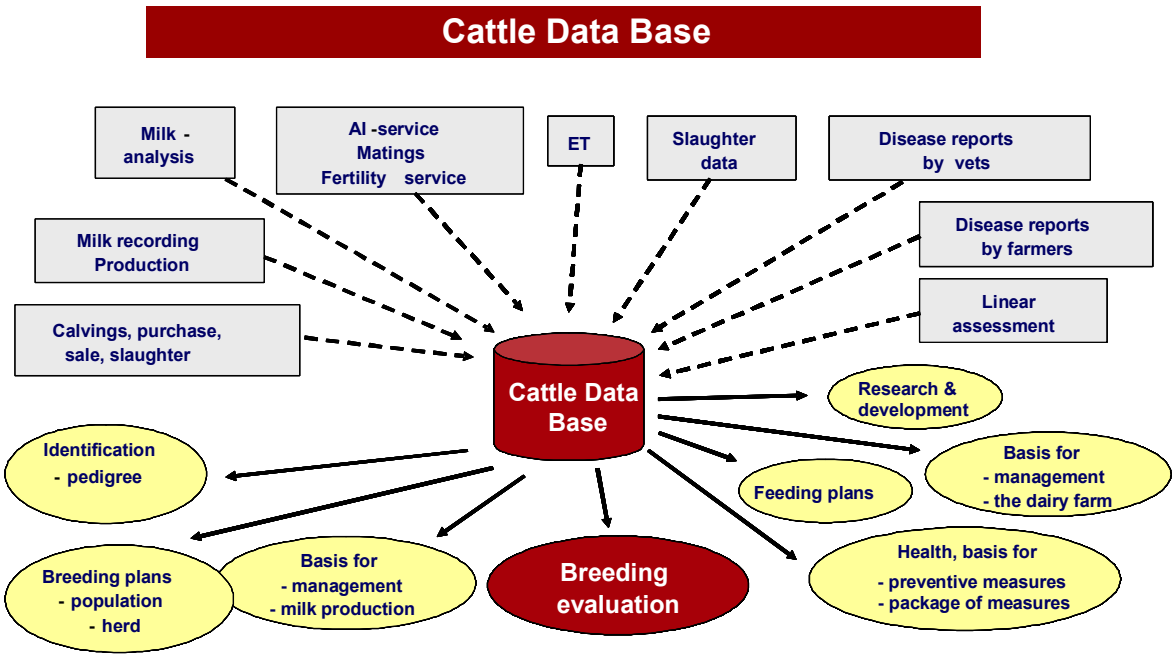
The Central Cattle Data Base

Any information about a cow or a herd is collected at our Central Cattle Data Base regardless whoever is recording the information. Also, it is essential that any information only should be recorded once. Once in the Central Cattle Data Base any authorized body can use such information. Therefore we have unique opportunities to incorporate all relevant data and information in order to optimize the manager's basis for making decisions re the herd or the individual cow, but also for the development of optimal computer programs to be used by managers and advisers.

What is the Cattle Data Base



Data flow – to and from the Central Cattle Data Base



Feed supply and feeding
Roughage for Danish cows means silage made of rye grass, grass/clover and/or Lucerne (alfalfa). Besides, the cows get concentrates (cereals, soybean meal, rapeseed etc.). The feed is fed as TMR at feeding stations or given via tractor driven mixers used in combination with a loader. Latest technology is automatic feeding on rail or wheels.

Right now "cows on pasture" is a hot issue in Denmark. Organic farmers must have their cows on pasture at least 150 days per year. Now the organization Danish Animal Welfare Society claims that any dairy cow should be on pasture during summer time. However, we do not believe that being on pasture necessarily is the best for the cow.

Trends of the coming years
In recent years over 3,000 farms have invested in new production systems, new technology and more milk quota. Danish dairy farmers accept new technology. These years Danish researchers – in close cooperation with relevant companies and the advisory system – invest huge resources in this field.

Right now more than 10 per cent of Danish Dairy farms use milking robots (AMS) and the number is increasing rapidly.

Hot issues right now are terms like animal health, animal welfare, environment, and food safety. The reason is not that we do not act at a high level in these fields, but the terms attract a lot of public attention.

The traditional family farms with pigs, cattle and plant production have more or less disappeared and have become dairy cattle companies. In the near future the fully integrated dairy production unit will be out sourced to independent units looking after calf rearing, beef production, feed/plant production etc.

The role of the farmer is changing from doing all physical work as a skilled craftsman to becoming a manager and leader formulating the strategy of the company and practising management re advisors, staff, production, and economy.

Technological opportunities
Roughage is a substantial part of the cow's feed. We are mapping the plants' genes in order to intensify selection for higher crop yields and more importantly to increase the accessibility of nutrients to the cow. We aim at grass crops etc. with a lower content of crude fibre – as the crop matures.

We go for changing the composition of cows' milk in order to be able to design specific kinds of milk.

Similarly we are mapping the cattle genes in order to select for more healthy and productive animals and prevent shortcomings as to reproduction, health, and nutrition.

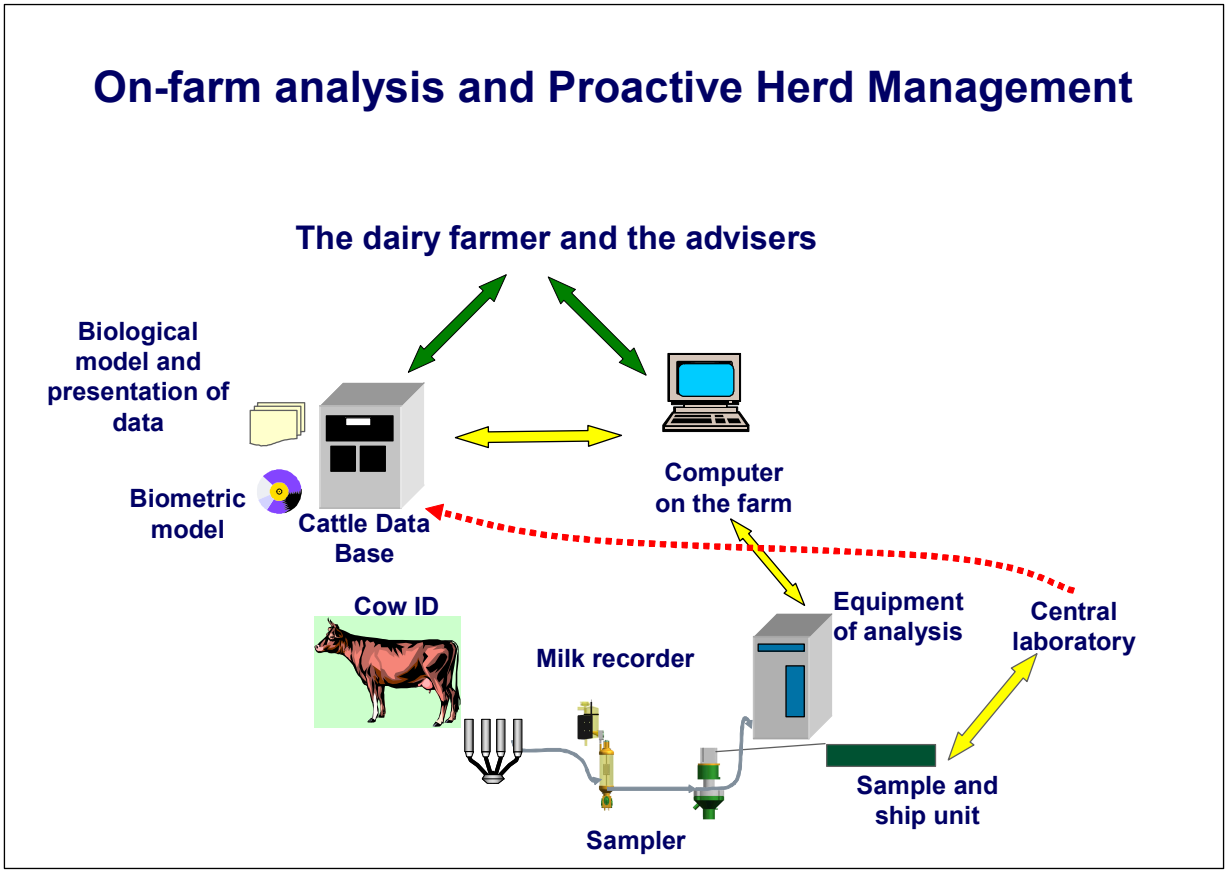
Most dairy farmers use herringbone parlours for milking, but you also find parlours with fast exit, and rotary milking. However, AMS (automatic milking systems) gains market. Right now approx. 600 Danish dairy farmers have AMS – that is one out of every eight! In average each farmer has two AMS units.

On-farm analysis and Proactive Herd Management

New and advanced tools like chips and sensors are just about becoming standard equipment in many Danish barns for dairy cattle. We place those tools close to the individual cow and GPS monitoring will make recorded data available to be part of the information from which the farm manager interprets not only the current state of the individual cow re reproduction, mastitis and other health characteristics, but also warns the manager even before such problems/events occur in the cow.

We want to use proactive management tools to improve productivity, improve the quality of the production, be able to document our production, and to watch for infectious diseases.

The principles of on-farm analyses and Proactive Herd Management is outlined in the following design:



At each milking a milk sample is analyzed. The level of progesterone tells about the cow's reproductive status; milk enzymes tell about health of the udder; ketones and urea levels tell about nutritional balances. The number of analyses will gradually be extended to also include the fat and protein contents of the milk and other new parameters.

On-farm analyses and Proactive Herd Management will be the first of several steps towards the greatest change in management, leadership, and advice in dairy cattle production within the latest 50 years.

Number of milk recorded dairy cows in Denmark

	Year							
1,000 head	74/75	79/80	89/90	99/00	02/03	03/04	04/05	05/06
Danish Red	184	129	71	54	48	44	43	42
Danish Holstein	319	403	369	399	391	375	367	366
Danish Jersey	108	109	91	71	66	62	60	60
Danish Red Holstein	4	8	5	5	5	5	5	5
Crossbreds	33	62	48	45	36	35	33	33
Others				<1	<1	<1	<1	<1
In total	**647**	**711**	**584**	**575**	**546**	**522**	**509**	**507**

Milk yield per cow

	Year							
Kg milk	74/75	79/80	89/90	99/00	02/03	03/04	04/05	05/06
Danish Red	5,117	5,346	6,712	7,316	7,847	8,119	8,380	8,560
Danish Holstein	5,230	5,528	7,143	8,075	8,694	8,900	9,122	9,232
Danish Jersey	3,863	4,089	4,954	5,614	6,004	6,185	6,346	6,436
Danish Red Holstein	4,761	5,079	6,309	7,148	7,641	7,820	7,982	8,296
Crossbreds	4,926	5,203	6,542	7,018	7,766	8,013	8,221	8,349
Average	**4,952**	**5,243**	**6,693**	**7,610**	**8,224**	**8,442**	**8,660**	**8,778**