

Holsteins in Denmark

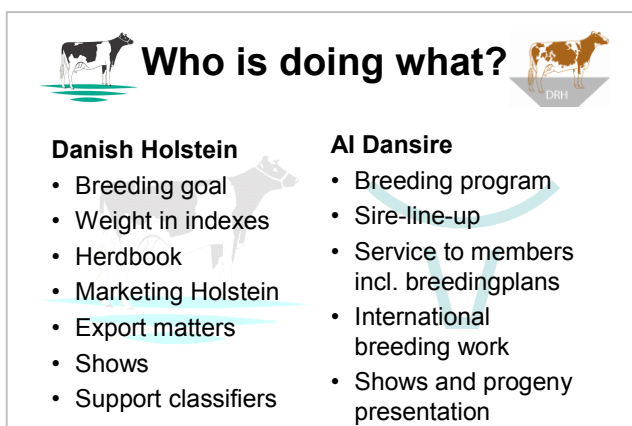
By *Keld Christensen*, Executive Secretary, Danish Holstein Association



Danish Holstein Association

The Danish Black and White Cattle Association was founded in 1949 when two major regional organisations merged. They had worked regionally since 1927 and 1946, respectively. Later other regional organisations joined the Danish Black and White Dairy Cattle Association, so that the entire nation has been covered since 1955. Later the organisation was adjusted according to new demands and changes in other organisations. In 1999 the name was changed to Danish Holstein Association, as this is a more correct title of the breed society and it clearly demonstrates our membership of the Holstein world.

Today Danish Holstein Association – Danish Holstein – is an active partner discussing and deciding on breeding goals, classification, herd book related matters, the weighting of traits in indexes and acting as the spokesman for all Holstein breeders. Danish Holstein is active at shows such as the National Show and Agromek as well as the European Championship. Promoting the Holstein breed nationally and internationally is a natural part of our agenda.



Over recent years Danish Holstein and Danish Red Holstein have developed almost identical breeding goals, but apart from that many milestones have been different.

Danish Holstein

According to history books black and white cattle in Jutland (Jutland cattle) have occurred since very early days. In the middle age thousands of cattle was exported annually to regions in Germany and The Netherlands – some years close to 50.000 head of cattle. The skin colour varied from black spotted over grey to red spotted.

The first herd book was formed in 1881 and thus we have just celebrated its 125th anniversary. The herd book at that time had a major impact on the breeding stock and breeding work, since herd book organisations had to accept all major changes in the breeding goal and also had to decide how to implement results from the breeding work in the herds. In 1895 the first Danish milk recording society was formed, but from counting 50 per cent of all cows in 1900 the numbers were down to 20 per cent in 1936. Today over 90 per cent of all dairy cows in Denmark are milk recorded.

Some breeders realised they had to find new ways to improve their herds, and they started to import bulls from The Netherlands. They voted for a greater impact from the Dutch Friesians, but not this was accepted until 1949. For years there was tough competition between these two black and white dairy breeds in Denmark.

Danish Red Holstein

Red Holstein origins from the Shorthorn breed that was based on English Shorthorn back in the 16th century, but later it was improved by red cattle from The Netherlands. In 1860 Shorthorn cattle in Denmark was mentioned for the first time. Through crossbreeding the Shorthorns settled in southern and western regions of Jutland. The first Shorthorn herd book was founded in 1906 and in 1933 the Shorthorn breed made up 16 per cent of all dairy cows in Denmark. Since the number decreased drastically for several reasons – milk production was too low, there was too much fat in the carcass, and breeders realised, that they had to consider other breeds, if red/white cattle should remain in Denmark.

In 1956 some breeders bought the first bulls of the MRiJ breed in The Netherlands and Germany. Soon MRiJ was fully accepted, and the number of cows and inseminations increased till 1975 when the Red and White Dairy Breed had 75.000 first inseminations. At that time a national AI organisation with Red and White bulls was responsible for the national breeding work.

At the same time the breeding goal was reconsidered. The number of inseminations with semen of beef breeds had increased, and the Danish Red and White Dairy Breed faced hard competition.

	# cows	Kg milk	Pct. fatt	Kg fatt	Pct. protein	Kg protein	Kg F+P
1950	11.551	3.647	3,75	137			
1962	845	3.748	4,00	150			
1972	2.846	4.812	3,89	187			
1982	7.331	5.265	3,96	208			
1992	4.806	6.453	4,05	261	3,33	215	476
2002	5.220	7.451	4,25	317	3,44	256	573
2004	5.393	7.709	4,35	336	3,47	268	604
2005	5.395	7.854	4,37	344	3,48	273	617
2006	5.324	8.191	4,38	359	3,46	283	642

After a few years the Danish Red and White breeders decided to put more emphasis on milk production, but still remain the breed as a dual purpose breed. From time to time Red Holstein bulls were introduced to the breeding program, and along with production the breed was improved for type and the mammary system. Today the breed, Danish Red Holstein, is a modern dairy bred, that meets efficient dairy farmers' demand.

International breeding

The introduction of Dutch Friesians to Jutland cattle indicated a more international breeding. From 1950 to 1970 many bulls from The Netherlands came to Denmark, and some of them really did a good job, and thus the black and white cattle again increased in number.

From the middle of the 1960'ies a limited amount of semen of Holstein Friesian bulls from North America was introduced. But the Holstein Friesian breed was not accepted until several investigations on the offspring's milk and beef production as well as the type were carried out and found acceptable. The number of black and white cows in Denmark continued to increase, see the table below.

Development of black and white cattle in Denmark, 1950-2006

	Milk		Fat		Protein		Kg		Milk recorded cows		1st inseminations	
	kg	%	kg	%	kg	F+P	Number	%	Number	%		
1950	3,872	3.92	152	-	-	-	94,294	11.5	93,430	12.1		
1960	4,484	4.02	180	-	-	-	110,336	12.9	432,164	26.7		
1970	4,927	3.98	198	-	-	-	241,785	40.3	632,392	45.6		
1980	5,528	3.98	220	-	-	-	402,624	56.2	718,537	62.9		
1985	6,430	4.05	260	3.32	213	472	384,713	59.3	685,046	64.8		
1990	7,143	4.21	301	3.30	235	536	369,610	63.2	577,432	67.0		
1995	7,384	4.22	311	3.35	247	558	402,462	67.3	550,623	71.5		
2000	8,075	4.10	331	3.37	272	603	399,245	69.5	530,995	73.6		
2002	8,405	4.09	344	3.36	282	626	390,832	71.3	487,414	74.1		
2004	8,900	4.12	367	3.38	301	668	375,305	71.9	489,146	74.6		
2005	9,122	4.12	376	3.38	308	684	366,767	72.2	475,642	74.2		
2006	9,232	4.12	380	3.35	309	689	366,084	72.3	475,842	74.0		

AI centres in Denmark

On September 1, 1936 the first AI Centre was formed to take care of artificial insemination on cattle. Within the next five years another 85 AI centres were formed, and in 1941 over 200.000 dairy cows were artificially inseminated. During the 1950'ies the number of AI centres was stable with 100-105 centres, and then the number began to decline. In 1968 the first AI centre used frozen semen, and from that time the number of AI centres declined due to request for efficiency and better programs to test bulls. Then it became easier to use the best proven sires more efficiently.

Inseminations as to June, 2007 (12 months).

	1st inseminations	Total inseminations
Danish Holstein	472.684	889.492
Jersey	84.500	148.358
Red Danish	69.818	120.235
Danish Red Holstein	12.126	20.915
Beef breeds	23.714	38.874

Since 2003 Dansire has been the only AI centre in Denmark as a result of a merge of the remaining six AI centres. The increase in milk production caused a change into fewer but bigger herds. To service them in the best possible way and to perform the breeding work as efficient as possible this merge was a natural step.

Sexed Semen

As the first farmer owned AI centre in the world Dansire started to produce sexed semen in 2006. The first calves from the test period have been born. Now all tests are approved with good results, and Dansire offers sexed semen to its members by routine.



Miss Holstein, National Show 2006
KOL Nixon daughter, breeder Per Therkildsen, Spørring

Scandinavia merges

Over the latest couple of years negotiations have been in progress in order to form a Scandinavian AI merge. As to January 2008 the Swedish AI Centre, Svensk Avl, and Dansire will merge. Current negotiations with Finland are expected to end successfully. The countries have the same breeding philosophy, about breeding for more health and reproduction so the merge follows naturally that work.

Danish Holstein in service

Today Danish Holstein is a mutual partner in exchange of genetics between countries. Since 1970 we have had a big import of semen from many bulls from several countries, but over the past 10-15 years export from Danish Holstein has increased rapidly to a high level, as our Scandinavian breeding philosophy is more and more accepted by dairy breeders internationally.

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Since 2000 several international AI centres have searched for superior genetics, and positively proven Danish sires have entered AI service in Sweden, Germany and The Netherlands. Hopefully France and UK will act similarly.

Breeding goals

Today Danish Holstein and Danish Red Holstein have similar breeding goals – with only a small difference in body strength. The breeding goal is based on the fact that breeders should be able to

work without problems with any cow. Therefore health and reproduction is maybe more important than production, but it is still important, that cows have a high production of fat and protein. Type, feet and legs as well as mammary play a major role as well, as this brings together all parts to create a strong and well balanced dairy cow to stay long in modern herds with many automatic tools of equipment.

For several years production has been the most important trait for the selection of sires and dams of the next generation of young bulls. At the same time we have selected for type. As long as we did not have registrations and breeding values for health and reproduction we improved longevity by selecting for production AND type. Now we use data re somatic cell count, inseminations and veterinary treatments to get better information about the individual cow. All that information is gathered and stored on the Danish Central Cattle Data Base and used to calculate relevant breeding values. Type is still of some importance, as especially feet and legs and mammary are important traits for the managing of cows. But several type traits like dairy ness (not too much), slope of the rump and body strength are important, too.



Within the Shorthorn and the black and white dual purpose breed we used to breed for type. The type of the Danish Red and White has changed into Danish Red Holstein – as it has happened in Germany and The Netherlands. But it is also important for Danish Red Holstein breeders to have the strong and healthy dairy cow that can produce for a long period. For years we have imported several young bulls from The Netherlands and Germany, and today we cooperate closely with a German partner re the breeding program.

Breeding program

Since the beginning of the 1970'ies all Danish dairy breeds have followed the young sire test program, and during the test period the bulls are in a waiting position. The decision made to let bulls re-enter the breeding program as proven sires takes place when the results per bull are highly reliable.

Test program and Total Merit Index (S-index)

Information and data for many traits are recorded on each bull. New traits are added as they are identified and found relevant. Since 1982 the individual breed's breeding goal has been expressed by the Total merit Index – in Denmark S-index. The S-index has regularly been adjusted according to new weightings as price relations change and/or according to changed emphasis on traits. As


		Production from Shorthorn to Red Holstein					
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new breeding values have been developed it has been decided whether to include them in the S-index. It is always the economic value or a certain trait that matters.

An overview on the S-index improvements since 1982 is shown.

Hoof health

With bigger herds, less time per cow, higher production and cattle breeders' and consumers' higher demands for quality it is necessary to pay more attention to hoof problems. When a cow is classified feet and legs are scored and locomotion registered, but still more and more dairy farmers have problems concerning health in cows' hooves. Danish Holstein cows seem to have more problems than other breeds, and we have intensified our search for alternative registrations, that



Development in S-index

- 🐄 First S-index in 1982
- 🐄 Second S-index in 1992 + following adjustments:
 - Udderhealth 1992
 - Calving ability 1994
 - Female fertility 1995
 - Slaughter-results 1999
- 🐄 Third S-index in 2002 + following adjustments:
 - Other health & Longevity 2002
 - Birth index 2004
- 🐄 Scandinavian Total Merit Index 2008 - expected

can lead to better knowledge and consequently less health problems in hooves. Everybody realises, that hoof problems lead to severe problems later on and to reduced lifetime production.

For years Swedish hoof trimmers have reported reliable hoof data, and estimated breeding values show high heritability and chances are good to reduce the problems – also through breeding. Therefore hoof quality is a new important trait for all of us to deal with. However, many decisions must be taken before Danish Holstein can add this information on all bulls.

Have we reached our goals?

You will reach your breeding goals when you strictly select sires and bull dams of the next generation of young bulls on the basis of the S-index. We have not always been enough successful when we select sire of sons from the internationally pool, since many sires do not have information which is identical to the Danish breeding goal. But we are coming closer and closer, and we are successful on most traits that are important to Danish Holstein farmers.



How close to breeding goal?

Genetic progress as % of what is possible as a maximum



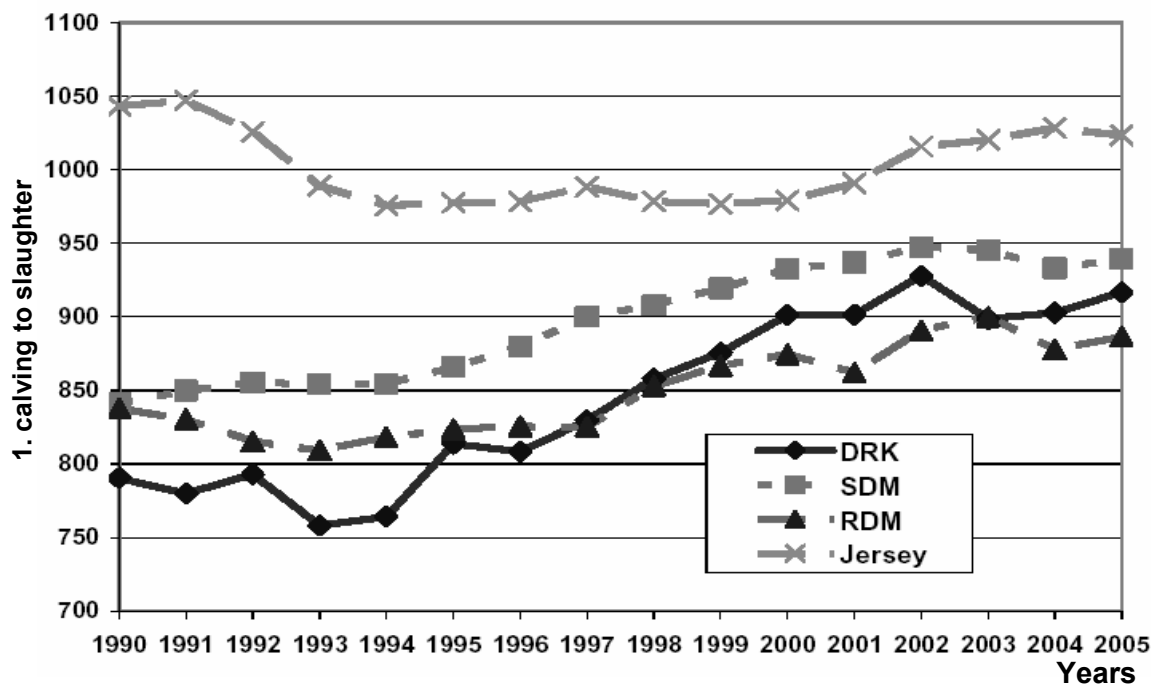
	Danish Holstein			Red Holstein
	1997	2005	2006	2006
MILKPRODUCTION	60	67	64	61
BEEF	16	18	8	-9
FEMALE FERTILITY	10	18	18	14
BIRTH TRAITS	-	25	28	43
CALVING ABILITY	28	37	40	37
UDDERHEALTH	27	35	40	28
OTHER HEALTH	-	37	44	35
BODY	29	13	13	20
FEET & LEGS	40	14	17	38
MAMMARY	37	29	43	55
MILK SPEED	19	27	24	16
TEMPERAMENT	19	4	7	-4
LONGIVITY	-	36	43	16

The most efficient way to select sires and bull dams is to use the S-index. Adjustments of the S-index made over the years have ensured maximum profit to the dairy breeder. Other traits can not reach 100 % due to e.g. negative correlations between traits such as milk production and female fertility, mammary as well as longevity. In a comparison over three years for Danish Holstein it is obvious, that progress is raised heavily for traits like female fertility, birth/calving traits, udder health and longevity. If progress should be 100 per cent for milk production – milk production would be the only selection criteria, you will face tremendous problems with fertility, udder health and mammary. And economic gain – S-index – would be reduced to 64 per cent due to severe costs because of health and fertility problems. If somebody would select only for type on long term, income would go down as well due to reduced milk production. In many countries the S-index – the Total Merit Index – has proved to be the best total selection tool for dairy breeders to use. But it is still important to register all relevant traits and to estimate breeding values for these traits.

In the new, future Scandinavian AI organisation it has been decided to create a common index for all traits to be used in Finland, Sweden, and Denmark. We already have joint evaluation for milk production, type, milking speed, temperament, female fertility and udder health. Breeding values for the remaining traits will be developed in the near future. In a joint breeding program it is essential to have a common Total Merit Index, so the selection of sires and bull dams can be done on the same background where all traits can be compared across two or three Scandinavian countries.

Longevity

We can easily measure the success of our breeding work from the period of time that cows produce. In bigger herds we spend less time on each cow, but we still expect more from each cow. It is interesting to realize, that over the years cows have got a longer productive life. You cannot compare such measure between countries, as many things influence each cow in the barn. The figure below shows the development in Denmark since 1990.



Status march 2007 Holstein and Red Holstein in Denmark

	Holstein	Red Holstein	All breeds
Milk production – 12 month			
Cows per herd	115,0	79,4	113,2
Number of cows	368.292	5.529	510.107
Kg milk	9.299	8.338	8.838
Kg fat	379	360	376
Kg protein	312	288	303
Beef production - 12 month			
Bulls: EUROP-class	3,7	4,0	3,8
Weight at slaughter	463	468	451
Daily gain, gram	967	1024	950
Cows: EUROP-class	2,5	3,1	2,5
Days after calving	293	269	284
Health - 12 month			
Cows: Case of illness per cow annually	1,08	1,01	1,04
Mastitis per cow annually	0,55	0,51	0,54
Calves: Pct. dead and stillborn 1. lact	11,3	11,3	10,7
Pct. dead and stillborn later	6,0	6,9	5,7
Pct. dead 1-180 days	5,9	6,5	6,6
Age at first calving	27,3	27,6	27,2
Pct. offspring AI-bull	85,8	91,0	86,5