BREEDING PROGRAM FOR A DAIRY FARM (MEDIUM & LARGE) Level 2

| Topic	Training & information Content
5.1	Dairy Cattle Breeds and Breeding
5.2	Breeding program for a dairy farm (medium & large)
5.3	Conformation, Type classification and judging
5.4	Cow handling
5.5	Milk production recording
5.6	Heat Detection
5.7	Artificial Insemination
5.8	Pregnancy Diagnosis
5.9	Fertility Management
5.10	Cows with abnormal discharge
5.11	Fertility disease recording
5.12	Calving recording
5.13	Use of Key Performance Indicators

1. You will learn about (learning objectives):

❑ Selection & Breeding strategies

❑ Importance and influences of traits

2. Background

- Breeding is not a tool that will immediately lead to better results, it's an ongoing process

- Breeding will have a chance to become successful when management aspects are fully under control

- Without selection, there is no chance of any improvement

- Beware that there are several selection methods with totally different outcomes. Outcomes also depend on the environment which selection method is most suitable
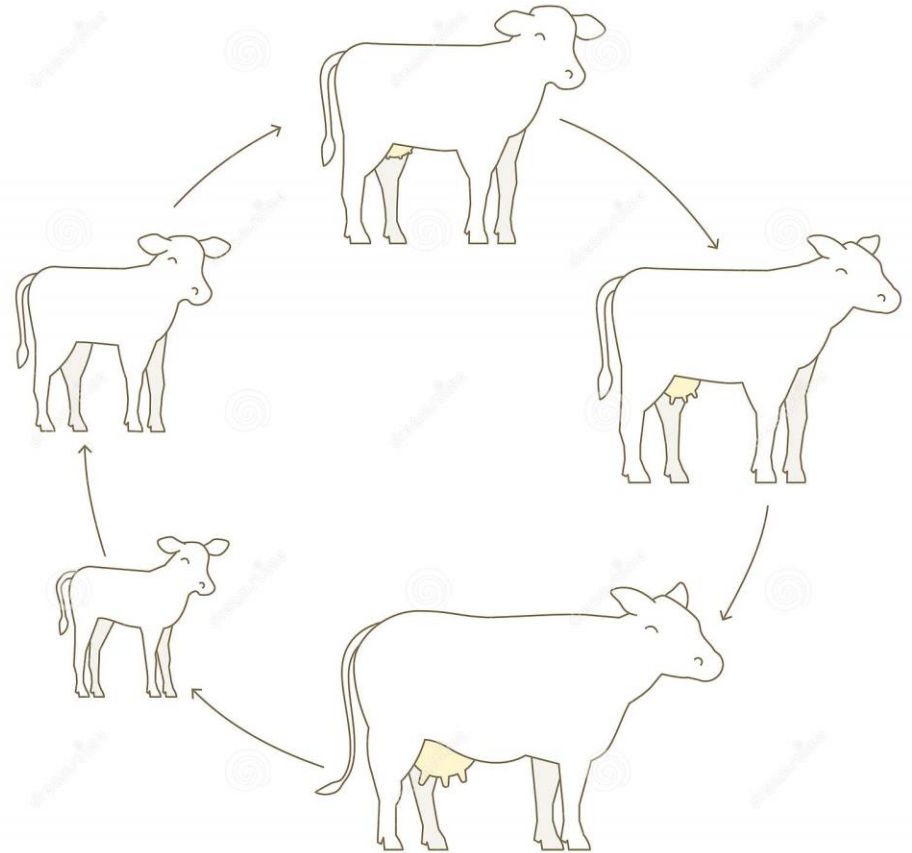
3. Breeding strategies complements selection

Breeding = Selection

- Breeding strategies include;

  1. Selection of cows to breed cows
  2. Selection of cows to breed bulls
  3. Selection of bulls to breed cows
  4. Selection of bulls to breed bulls

Traditional breeding

Strategic breeding (selection)
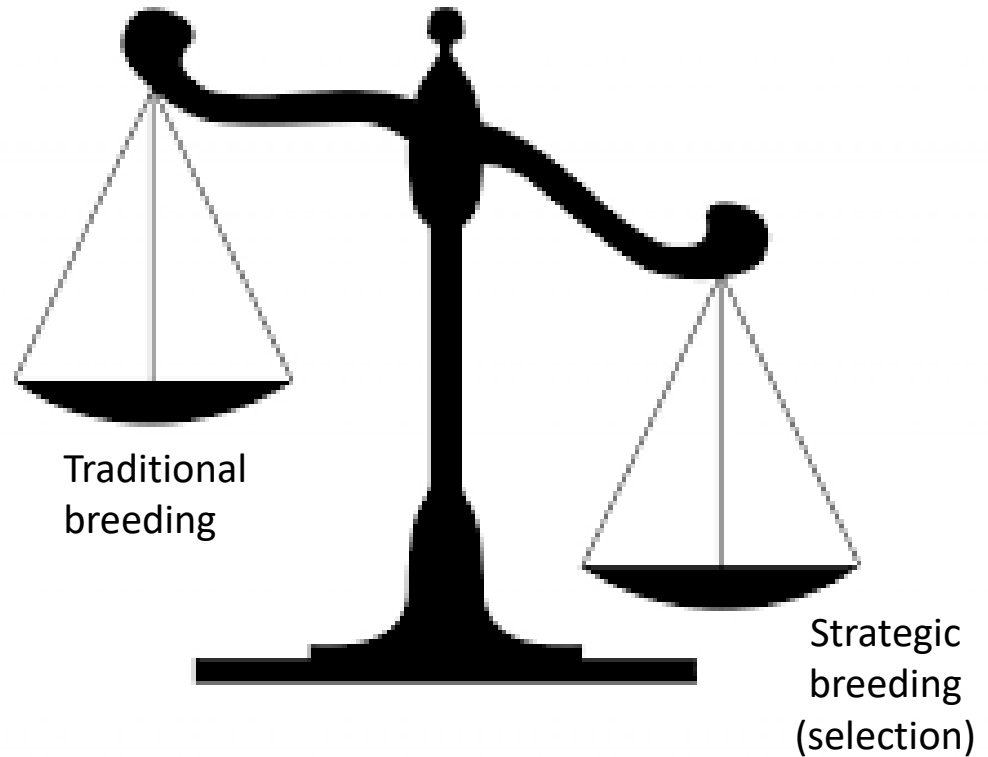
4. Important 'You Knows' before going into breeding

- The impact of genetics and environment
- Being aware of all the heritabilities
- How to use Heterosis

- There are many breeding systems that one can choose;
    - Pure Breeding
    - Cross Breeding
    - Grade up
    - Back crossing/crisscrossing
    - Rotational crossing

- Being aware of the genetic recessives in some breeds

5. Traditional Breeding Strategy

- One bull is used for the whole herd
- Bull selection is usually based on general external appearance
- Often, a bull stays in farm for too long. This causes inbreeding, infertility, poor performance.
- There is Low/No genetic progress

Any bull is used without pedigree information. Selection usually takes place based on external appearance. Examples of external appearance are Size and Body weight, Skin color. External traits don't give any information about economical qualities

5.1 Traditional Breeding Strategy Cont'd...

Selection of cows to breed cows

X

40 ♀

1 ♂

The results of this breeding strategy is mostly disappointing. <u>No improvements!</u>

2015	2021	2026

6. Selection

- In case of natural mating and/or AI is not available;
  - more emphasis on <u>bull selection</u>
  - <u>data collection </u> is extremely important to make progress

- In general, bulls have a major impact on the performance of the cows:

  - If the mother of the chosen bull is a good producer, his daughters have a high chance to become good producers as well
  - When the gestation period of the chosen bull has been very long, his calves will also have longer gestation periods, leading to dystocia/mortality.
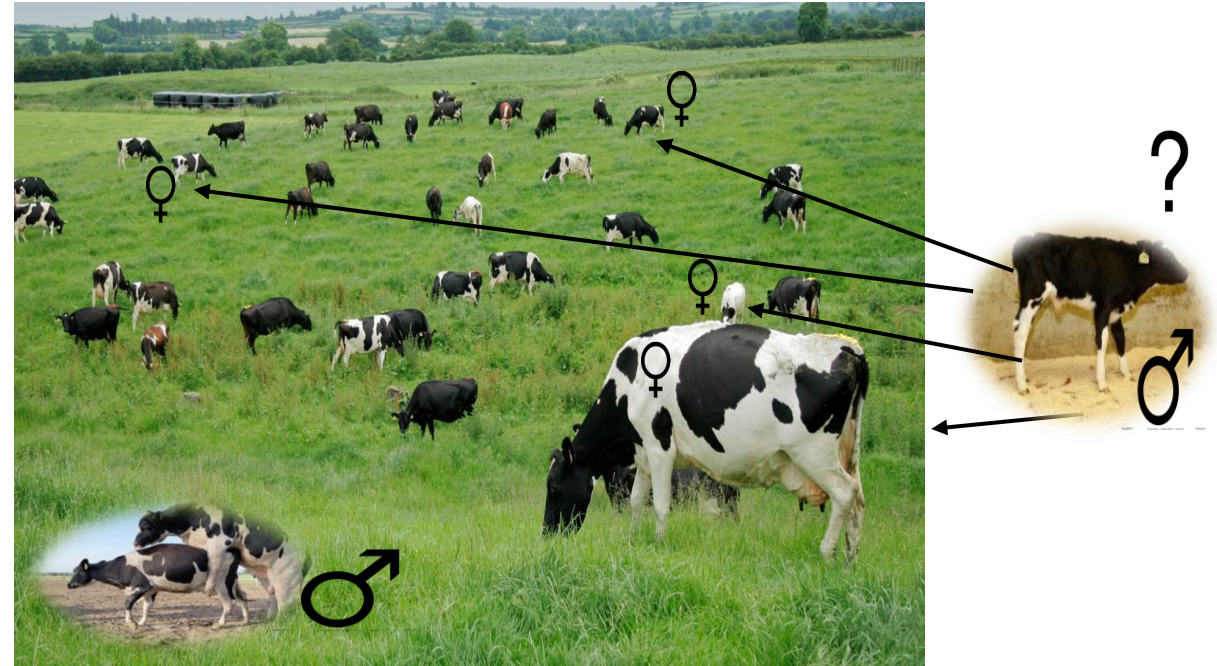
6.1 Selection Cont'd…

No Breeding without Selection
No Selection without data

- When data is administrated in the right way and interpretated correctly, it's the key to a <u>successful</u> breeding program.

Cow identification: ……

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Week:							
AM yield							
PM yield							
Day							
Week:							
AM yield							
PM yield							
Day							

IDENTIFICATION - PEDIGREE - ORIGIN - REMOVAL — CARD NO:

Name/No: — Date of Birth: — Registration No:

Date of Purchase: ___ Purchased from: ___ Price: ___
Date Left Herd: ___ Sold to: ___ Price: ___
Reason: ___
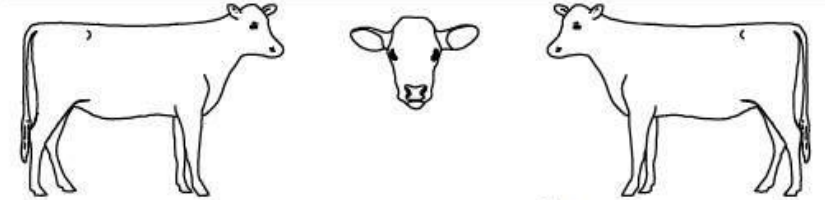
SIRE — Name/No: — Card No:
DAM — Name/No: — Card No:

SIRE — Name: / Reg.No.
DAM — Name: / Reg.No.
SIRE — Name: / Reg.No.
DAM — Name: / Reg.No.

BREEDING AND CALVING RECORD

*DFH = days to first heat; DFS = days to first service; DO = days open; SC = services per conception; CI = calving intervals

7. Breeding Program

- Drawing a sound breeding program entails:

Step 1: What do you have?
- Strong and weak points of your cows
- Record analysis
- Make a priority list

Step 2: What do you want?
- To improve(max 3 traits /generation)
- Bull selection

Step 3: What do you do?
- Which cow combined with which bull
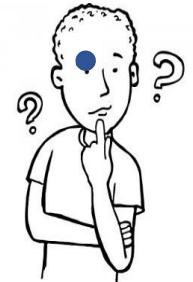
8. The importance of a well-considered breeding plan

- A breeding plan is a document that is used for years until the results become visible and, above all, measurable. Only then should the chosen breeding plan be re-examined

- The challenge is to present the chosen breeding plan clearly and simply using the three steps, 1e - What do I have, 2e - What do I want, 3e - What do I do.

- Results of the agreed breeding plan will be visible (at the soonest) after one year when the calves are born

- Results of the agreed breeding plan will be measurable (at the soonest) after 3-4 years when the first heifers come in milk

Beware: Breeding is a long-term policy!

9. Breeding Program: Score form

What do I have;
- How do my cows look like, and what needs to be improved to optimize performance

What do I want;
- The form says ; you must try to find a bull mother with a high production with short teats and a lot of capacity with a nice sloped medium rump

What do I do;
- With the outcome you can try to find a bull/bull mother

stature	low		tall
depth	shallow		deep
chest width	narrow		wide
rump angle	high		sloped
rump width	narrow		wide
udder depth	shallow		deep
teat length	long		short
udder cleft	weak		strong.
milk production	low		high
fertility	poor		good
udder health	poor		good

Example of how a score form can look like

10. Breeding strategy

Selection of cows to breed bulls
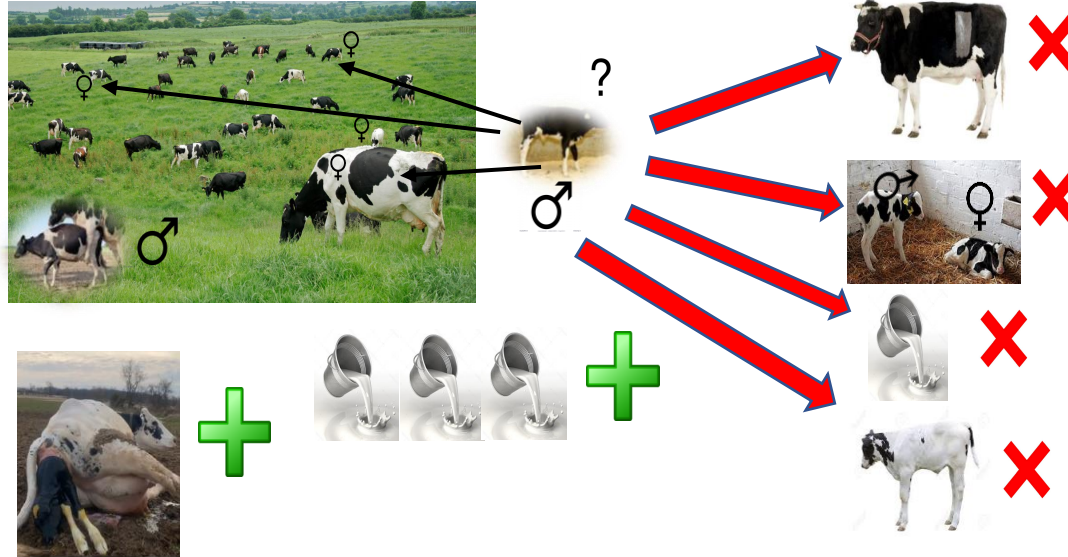
This breeding strategy requires patience, the results will only be visible in 5 years, a long-term policy though

2015 **2021** **2026**

10.1 Breeding strategy Cont'd...

Estimates and Assumptions

- Bull is born out of high producer - his daughters may do well

- Bull is born easily without assistance - his calves have a high chance to get born easy

- Bull is born out of fertile mother - his daughter probably will also be fertile
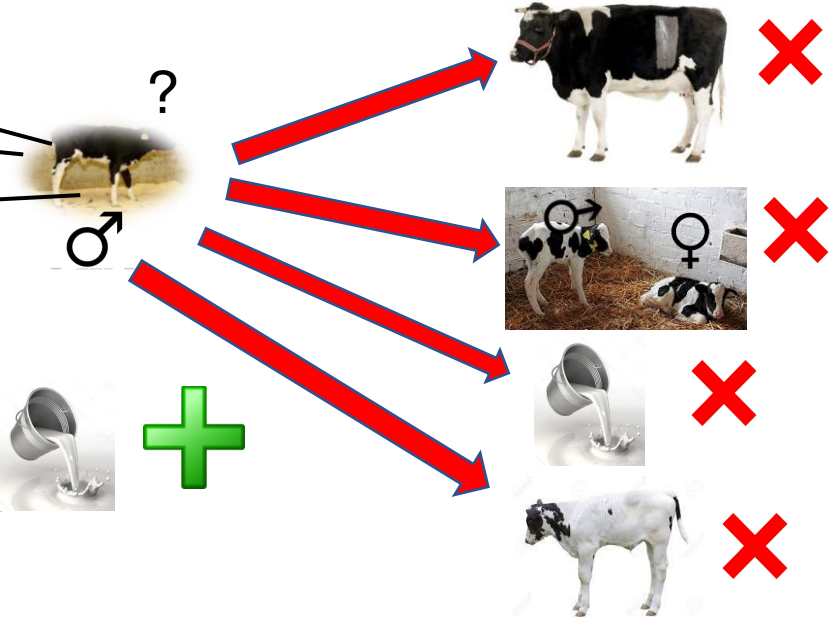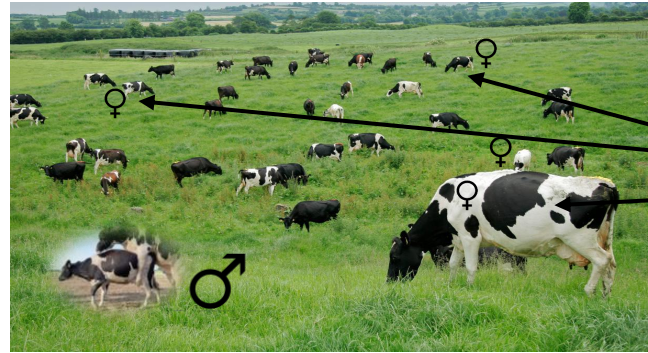
Bull is born out cesarian.
Bull is born out twins(female/male)
Bull is born out low prod cow.
Bull calf is completely white
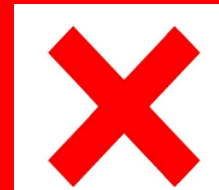
Dystocia/mortality.
Infertile bull.
Low producing off spring
Offspring sensitive for sunburn.

11. Artificial Insemination (AI)

AI is;

- A tool that helps farmers increase the genetic potential of their herd

- A tool that helps eradicate infertility

- A tool that helps speed up the accomplishment of the breeding goal

- A tool that offers the possibility to mate each cow individually, whereby qualities and shortcomings are considered

12. Selection of bulls to breed cows

Questions to be answered:

1. Which breed do you prefer? *(Refer to theme on Cattle Breeds)*
2. Does the breed fit into the environment?
3. Is the breed (semen) available?
4. Are competent AI technicians available?
5. Do we know how to interpretate the data?
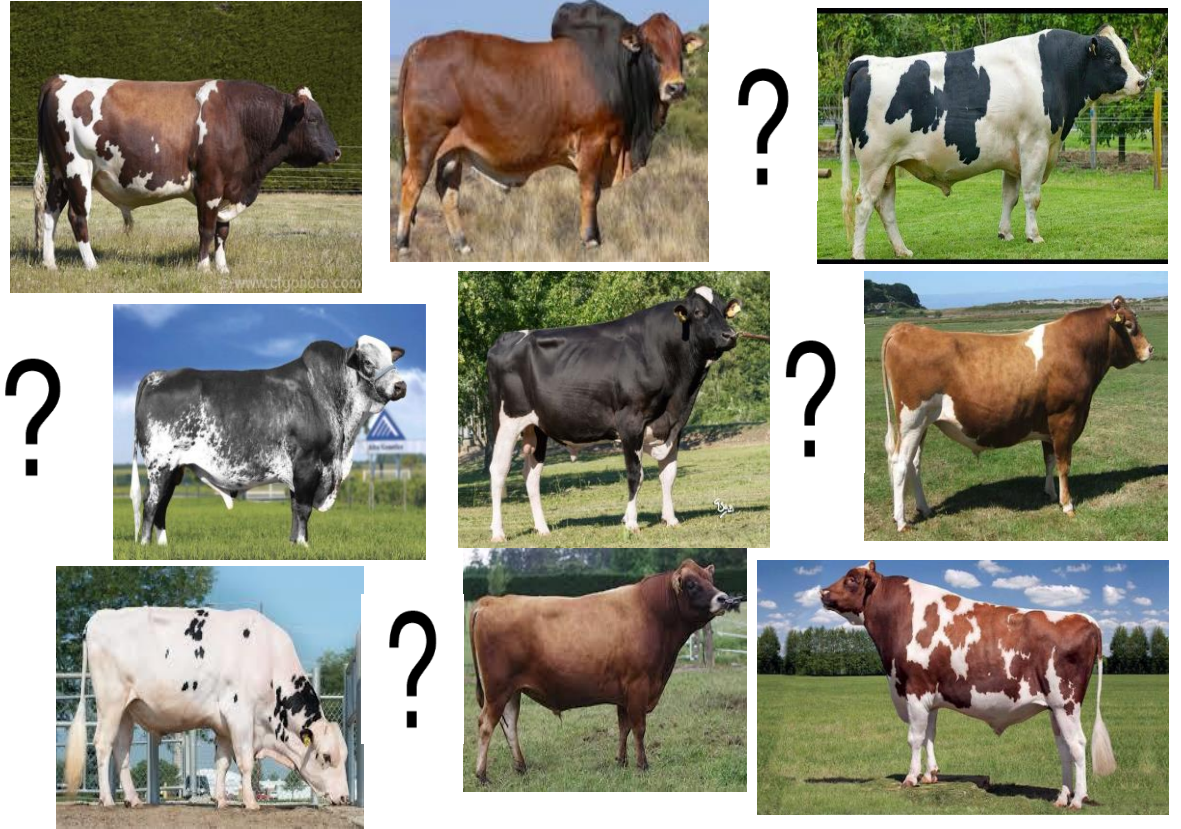
13. Selection of bulls to breed cows: Breeding indexes/values

- Information /data from all over the world is available

- Breeding indexes/values do tell you how the daughters of a bull perform compared to the breed's standard in the country of origin

- The implementation of all these foreign information in the right way is a challenge. Breeding indexes/values of different breeds should not be compared.

PRODUCTION TRAITS

Daughters Avg. Milk (Kg)	12600
Fats (%)	3.71
Fats (kg)	467
Proteins (%)	3.09
Proteins (kg)	389

	Daughter fertility	105	Production (€)	275
+5%	Udder health	102	+6% Longevity	553
	Hoof health	109	Feed efficiency	101

Production traits
2,475 dtrs, 1,252 herds, reliability: 91%

Kg Milk	% Fat	% Protein	Kg Fat	Kg Protein
578	0.40	0.14	62	33

Management/Health

SCC	103
Ketosis	102
Milking speed	112
Temperament	109
Daughter calving ease	103
Daughter calf vitality	102
Persistency	103
Maturity rate	98
Age of first calving	101
Body weight	106
Sire calving ease	102
Sire calf vitality	102

Outstanding new genomic Norwegian Red sires - Nor...

777HO03913 UNIX

12/2020 CDCB SUMMARY MACE				NM$ +222
Milk	+548	99%R	Fluid Merit $	+236
Fat	+26	+0.02%	Cheese Merit $	+216
Protein	+12	-0.02%	Grazing Merit $	+208
SCS	2.95	98%R	Gestation Len. +0 Fert. Index +0.2	
PL	+0.8	96%R	Livability -1.4 Mastitis +0.2	
DPR	-0.1	96%R	EFI 8.1% gEFI 10.9%	
HCR	+1.3		28532m 3.8% 1096f 3.1% 875p	
CCR	-0.5		13952 Dtrs 4752 Herds 7% US	

12/2020 CALVING SUMMARY			SCE 1.7 %
Sire Calving Ease	1.7%	99%R	50071 Obs
Daughter Calving Ease	2.3%	96%R	1002 Obs
Sire Stillbirth	4.2%	97%R	48470 Obs
Daughter Stillbirth	6.1%	94%R	928 Obs

12/2020 HA TYPE SUMMARY			TPI +2355
PTAT +2.40 98%R UDC+2.40 FLC-0.05 BSC +0.41 6840 D / 2904 H

Stature	+2.06	Tall
Strength	+0.66	Strong
Body Depth	+1.46	Deep
Dairy Form	+2.03	Open Rib
Rump Angle	+1.12	Sloped
Thurl Width	+1.73	Wide
Rear Legs-Side	+1.24	Sickle
Rear Legs-Rear	-0.21	Hock In
Foot Angle	-0.05	Low
Feet & Legs Score	+0.64	High
F. Udder Attachment	+2.62	Strong
Rear Udder Height	+3.43	High
Rear Udder Width	+3.17	Wide
Udder Cleft	+2.64	Strong
Udder Depth	+1.86	Shallow
Front Teat Placement	+2.47	Close
Rear Teat P. Rear	+2.66	Close
Teat Length	-0.95	Short

Type Conformation
Reliability 93% 197 Daughters in 91 Herds

Trait	Poor		Excellent	
Type Merit	Poor		Excellent	+1.25
Mammary	Poor		Excellent	+0.32
Legs & Feet	Poor		Excellent	+2.45
Stature	136cm		160cm	+0.43
Chest Width	Narrow		Wide	+0.28
Body Depth	Shallow		Deep	-0.50
Angularity	Coarse		Open Rib	-0.41
Rump Angle	High Pins		Low Pins	+2.54
Rump Width	Narrow		Wide	+0.34
Rear leg side	Straight		Sickled	-0.61
Foot angle	Low		Steep	+0.76
Fore udd att	Loose		Tight	+0.89
Rear udd ht	Very Low		Very High	+0.76
Udder supp	Broken		Strong	+1.01
Udder depth	Below Hock		20cm above	+1.67
Front teat pl	Outside		Close	+1.52
Teat length	Short		Long	-5.40
Rear teat pl	Apart		Close	+1.68
Teat pos side	Close		Apart	-0.36
Temperament	Poor		Good	-0.28
Ease of milk	Slow		Fast	+0.80
Locomotion	Poor		Excellent	+3.26
Cond Score	Low		High	+0.74

BREEDING VALUES

TIP	%Rel	NVI	INET	Lgv.	Base
93	4	91	-36		Z

%Rel	Dtrs	Hrd	Base	Src
91	77	45	Z	NLD

Production index

%Rel	Dtrs	Hrd	Base	Src
97	416	190	Z	NLD

Kg milk	% fat	% prot	Kg fat	Kg prot	Inet
159	0.2	0.04	25	9	91

Functional traits

Sire		
Calving ease	98	93
Vitality	94	85
Beef index	99	62

Daughters

Fertility	102	92
NR	99	88
Calving interval	101	94
Mat. Calving process	99	78
Mat. Vitality	99	88
Persistency	103	95
Maturity rate	93	91
Udder Health	95	97
Somatic cell count	94	97
Milking speed	95	87
Robot efficiency	96	50
Robot interval	102	50
Robot habituation	96	50
Claw health	98	79
Temperament	102	73
Body weight	96	76

Type score

%Rel	Dtrs	Hrd	Base	Src
91	77	45	Z	NLD

Frame	95
Type	99
Udder	98
Feet & Legs	98
Total Score	96

Stature	95
Chest width	99
Body depth	95
Angularity	96
Condition	103
Rump Angle	95
Rump Width	96
Rear legs Rear view	97
Rear leg Set	102
Foot Angle	98
Locomotion	99
For udder attachment	100
Front teat placement	95
Teat length	107
Udder depth	95
Rear udder height	95
Central ligament	96
Rear teat placement	95

14. Successful breeding strategy

Selection of bulls to breed cows
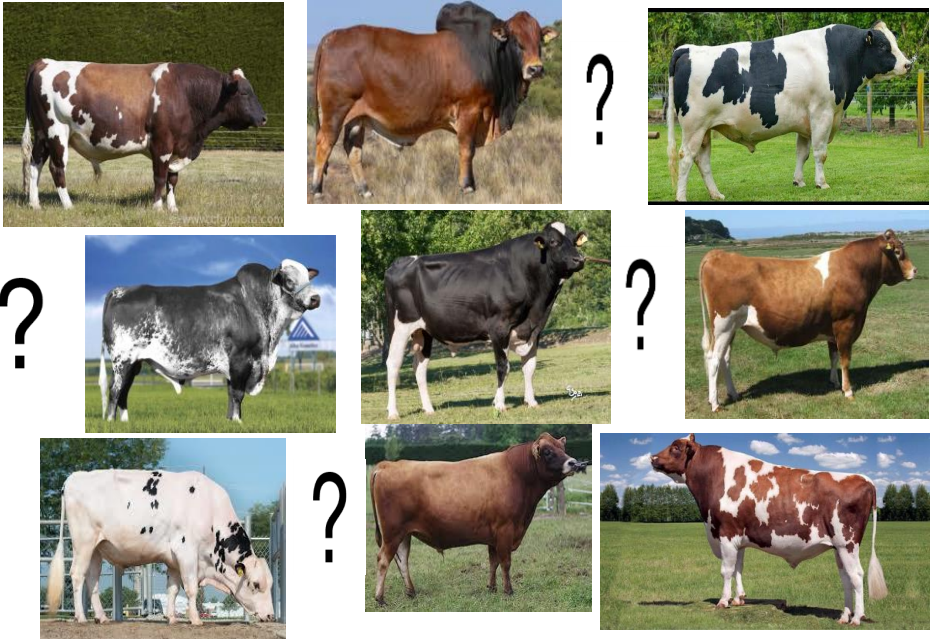
A very successful/good breeding strategy that has led to a big increase of milk production and improved udder conformation world wide

2015	2021	2026

- END -