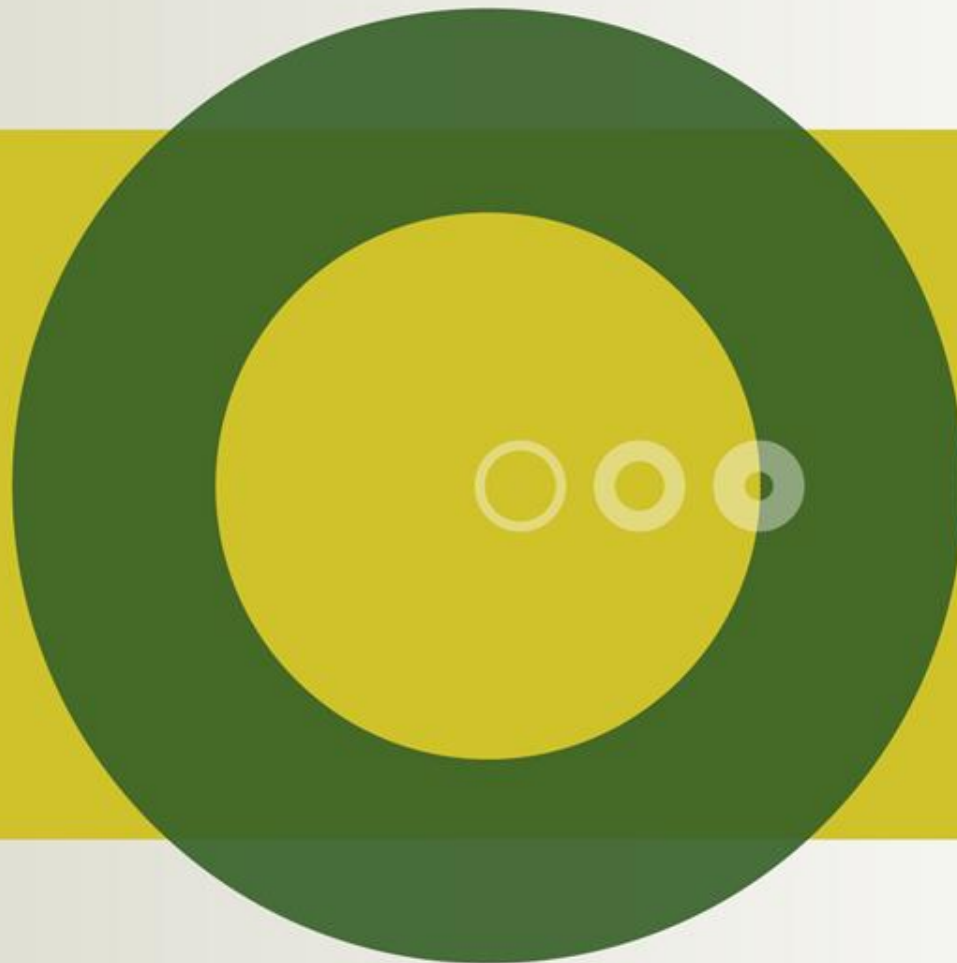# Utbildnings och diskussionsdag rörande Handdatorprogrammet

Jönköping and Uppsala
January 2012

Anders Fogh

Videncentret for Landbrug, Kvæg

Main idea

- **Common classification system in Sweden, Finland and Denmark**

- **Body, feet&legs, udder and total score can be compared from Northern Finland to Southern Denmark**

- **Develop and maintain best, cheapest and most efficient**

Time schedule for new software

- **Situation in Denmark, Sweden and Finland in 2008-2009**
- **Initial meeting in Malmø in early 2009**
- **Danish, Swedish, Finnish agrement in late 2009**
- **Programming started early 2010**
- **Meeting about optimum, weight factors ect. early 2010**
- **Lots of discussions, testing ect.**
- **Software was launched in May 2011**

Persons involved in development of software

Tecnical project leader

Basic calculations

Steering group

Tecnical project group

Responsible for test and more!

And more!

Political decisions

Developed classification system

Farm

Home or farm

National databases

Use best available technology

Conformation dictionary

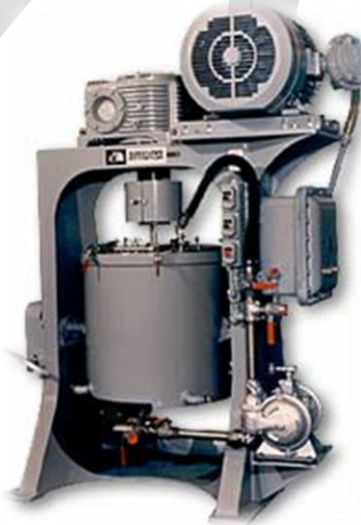- Sections of traits

  Number for Body, feet&legs and udder

- Final score

  Body, feet&legs and udder weighed together

What will I talk about today?
"Calculation machine"

Inputs: Cows, Optimum, weights, ….

Output: Body, feet&legs…

Machine: Corrections, model ….

"Political" input

- Nordic optimum within breed
- Nordic weight factors within breed
- Wanted average and standard deviation
- Nordic rules for classification
  - Which lactations are classified?
  - What is a standard cow?
  - Max for total score in 1. lactation
  - …….

"Biological" input
1st lactation cows

	RDC	Holstein
Denmark	11.000 (25%)	75.000 (75%)
Sweden	16.000 (37%)	16.000 (16%)
Finland	16.000 (37%)	9.000 (9%)

Important to remember!
Average is not supposed to be 80 in all countries

	Genetic level for Holstein		
	B	F&L	M
Denmark	100,7	101,6	101,1
Sweden	97,3	97,7	100,4
Finland	94,5	96,4	98,4

Cows born in 2008

Important to remember!
Average is not supposed to be 80 in all countries

	Genetic level for RDC		
	B	F&L	M
Denmark	108,3	105,0	105,4
Sweden	99,4	100,0	100,4
Finland	97,3	97,4	97,9

Cows born in 2008

"Human" input
Standard deviation for linear traits

	Sweden	Denmark	Finland
Body depth	0.7	0.7	1.0
Chest width	0.8	0.8	1.1
Dairy form	0.8	0.7	1.1
Top line	0.8	0.9	1.1
Rump width	0.8	0.8	1.0

Calculation "Machine"

- **Rest of talk will be on what is in the machine**

- **BUT remember that INPUT have large effects on output!**

- **Deviations from expected can be due to INPUT**

Calculation "Machine"

Important to remember:

○ **All calculations are done within breed with breed specific "input"**

○ **Body, feet&legs, udder and final score can NOT be compared between breeds**

Starting point for calculation of section of traits

What does the cow look like on time of classification?

Compare section of traits/final score on all cows!

Starting point is different!

- **Lactation**

  1. calver >< 3. calver

- **Age at calving**

  24 months >< 36 months

- **Distance from calving**
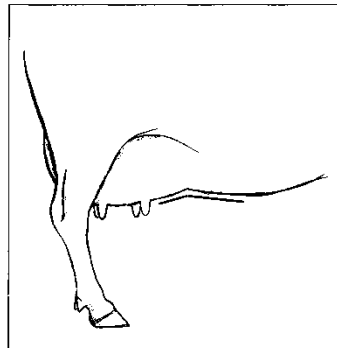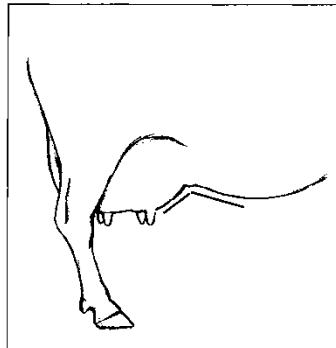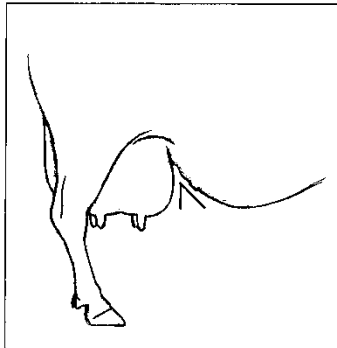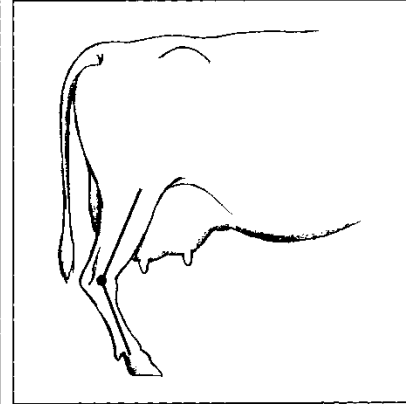
  2 months>< 8 months

Procedure in "machine"

Classification

↓

Correction

↓

Calculation of section of traits and final score
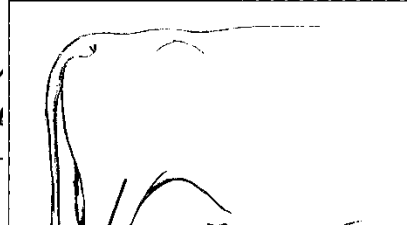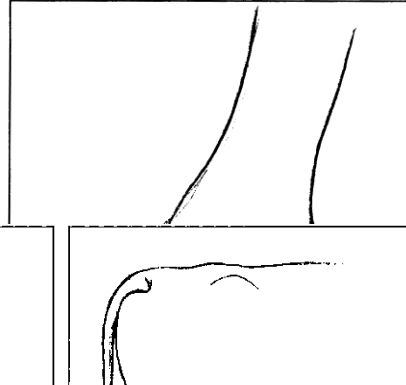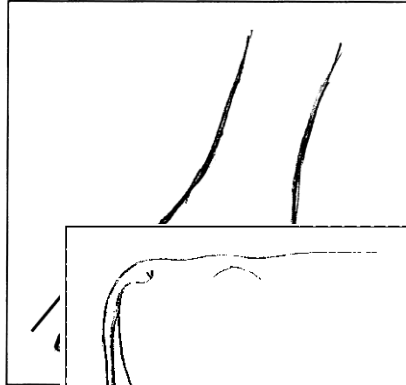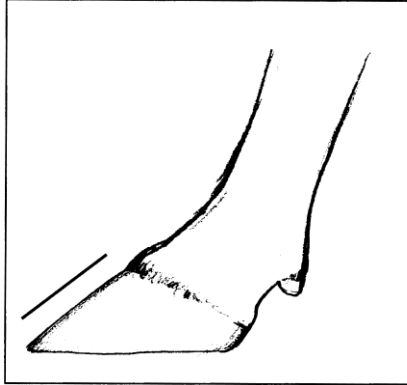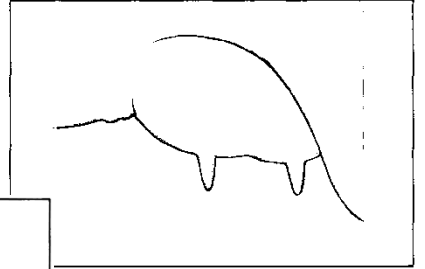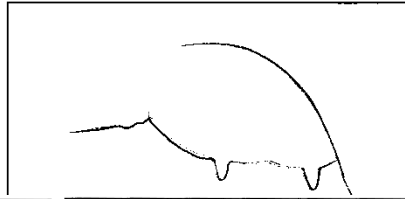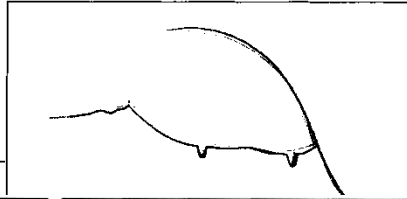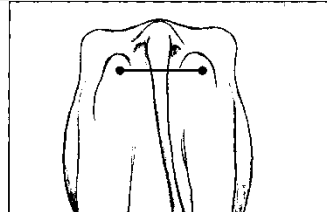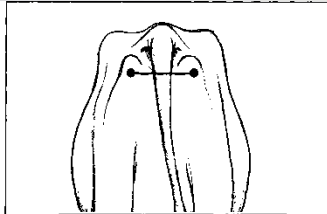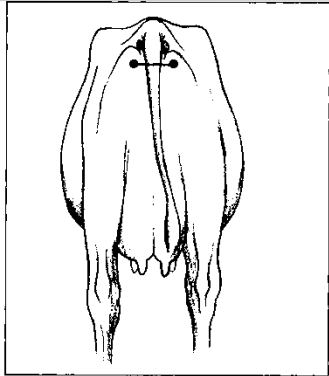
Procedure in "machine"

Classification

Correction

Calculation of section of traits and final score

"Standard cow"

A cow classified in:

- 1st lactation

- 28 (RDC) or 26 (Holstein, Jersey) months at calving

- 4 months from calving

- 7 hours from milking

Is not corrected!!!

All other cows are "corrected back or forth" to the standard cow

Correction factors

1st lact.	2nd lact.	3rd lact.	4th lact.	Later lact.
Age at calving				
	Parity	Parity	Parity	Parity
Dist. from calving	Distance	from		calving
Time from milking	Time	from		milking

Correction factors

- **Corrections are breed specific**

- **All traits are corrected in the same way!**
  - **Corrections for some traits might be zero**

Age at calving - HOL

Age at calving - HOL

17. Udder support
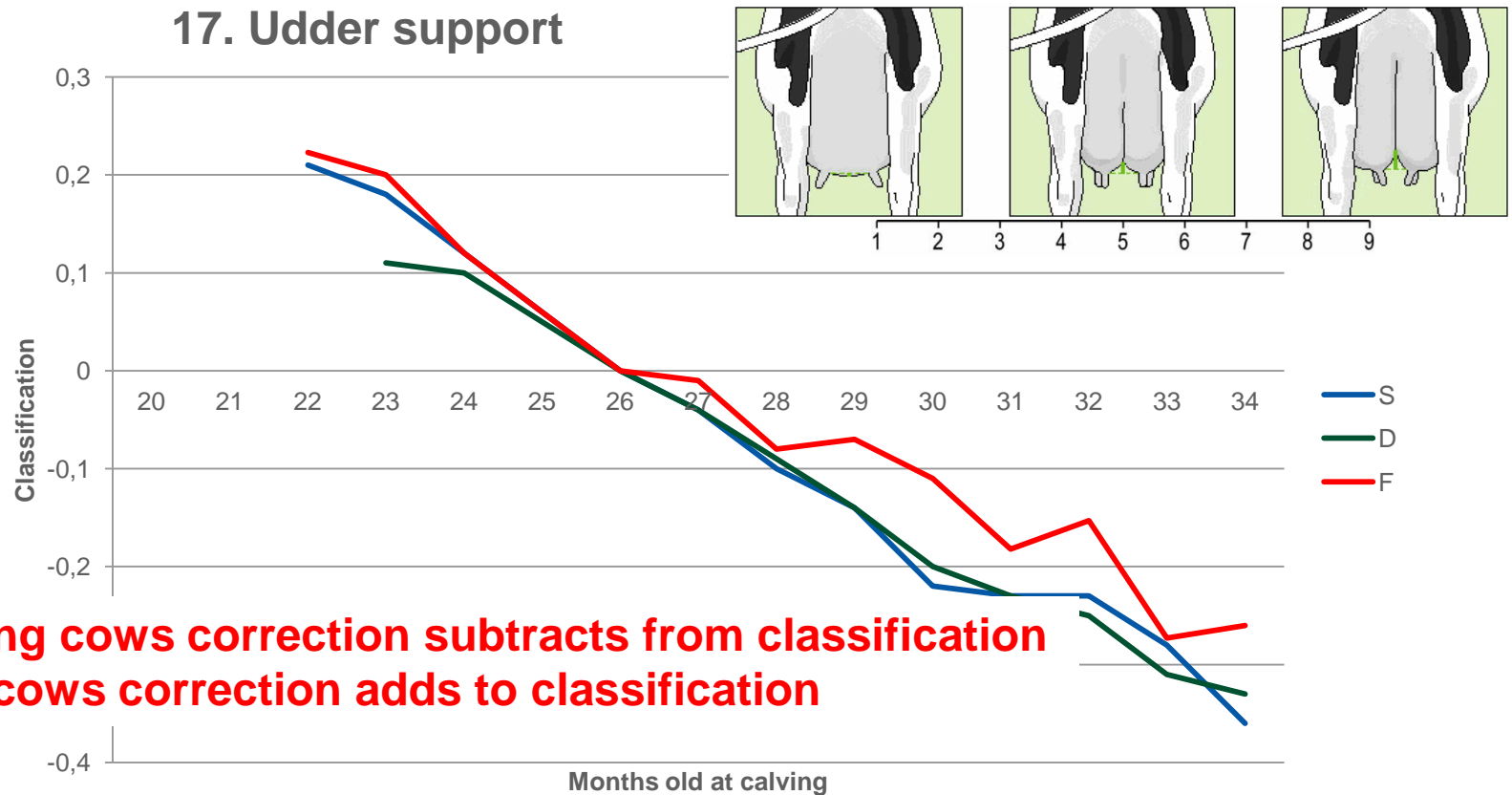
Corrections for age at calving

HOL

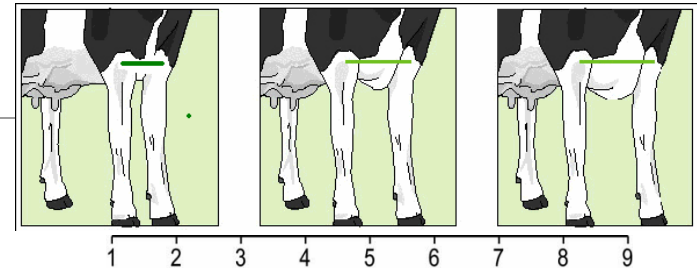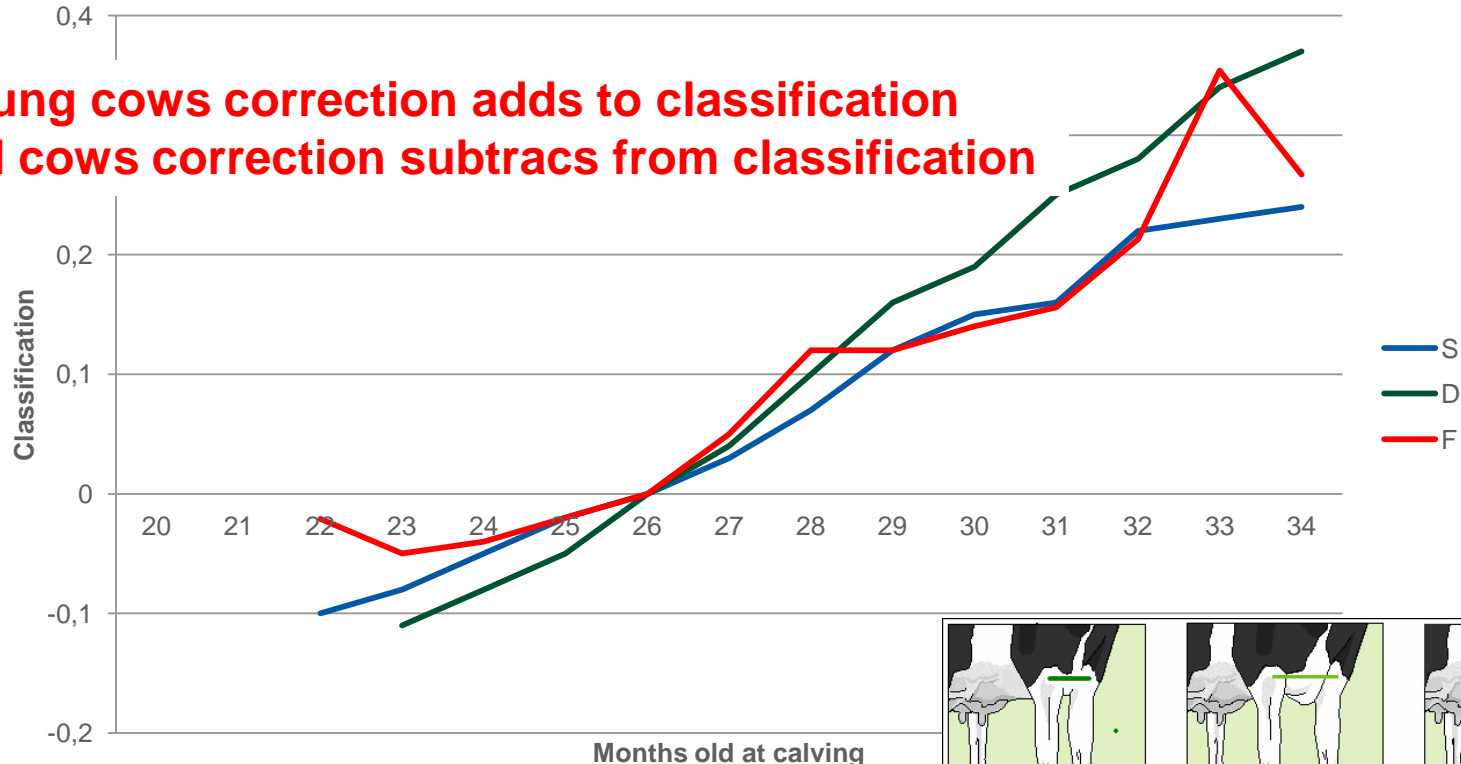|	
1. Stature	0,19
2. Body depth	0,07
3. Chest width	0,07
4. Dairy form	0,00
5. Top line	0,00
6. Rump width	0,05
7. Rump angle	0,00
8. Rear legs, side view	0,00
9. Rear legs, back rear view	0,00
10. Hock quality	0,00
11. Bone quality	-0,03
12. Foot angle	0,00
14. Fore udder attachment	0,03
15. Rear udder height	0,00
16. Rear udder width	0,03
17.Udder cleft/support	-0,05
18. Udder depth	0,00
19 Teat length	0,03
20 Teat thickness	0,03
21 Teat placement (front)	-0,03
22. Teat placement (back)	-0,03
23. Udder balance	0,00

RDC

1. Stature	0,17
2. Body depth	0,03
3. Chest width	0,03
4. Dairy form	0,00
5. Top line	0,00
6. Rump width	0,04
7. Rump angle	0,00
8. Rear legs, side view	0,00
9. Rear legs, back rear view	0,00
10. Hock quality	0,00
11. Bone quality	-0,03
12. Foot angle	0,00
14. Fore udder attachment	0,03
15. Rear udder height	0,00
16. Rear udder width	0,00
17.Udder cleft/support	-0,05
18. Udder depth	0,00
19 Teat length	0,00
20 Teat thickness	0,00
21 Teat placement (front)	-0,03
22. Teat placement (back)	-0,04
23. Udder balance	0,00

Correction for parity

Udder depth

2. lactation

1,8 point

3,5 point

4. lactation

1. lactation

2,8 point

4,0 point

3. lactation

5. lactation

VIDENCENTRET FOR LANDBRUG

Corrections for parity - RDC

Difference between 1st to 2nd parity	Used Nordic
1. Stature	1,4
2. Body depth	0,8
3. Chest width	0,5
4. Dairy form	0,4
5. Top line	0,0
6. Rump width	0,5
7. Rump angle	0,0
8. Rear legs, side view	**0,0**
9. Rear legs, back rear view	-0,1
10. Hock quality	0,0
11. Bone quality	0,1
12. Foot angle	0,0
14. Fore udder attachment	-0,3
15. Rear udder height	-0,2
16. Rear udder width	0,4
17. Udder cleft/support	0,1
18. Udder depth	**-1,5**
19 Teat length	0,3
20 Teat thickness	0,5
21 Teat placement (front)	0,0
22. Teat placement (back)	0,0
23. Udder balance	0,0

Difference between 1st to 3nd parity	Used Nordic
1. Stature	1,4
2. Body depth	1,2
3. Chest width	0,7[1]
4. Dairy form	0,5
5. Top line	0,0
6. Rump width	1,0
7. Rump angle	0,0
8. Rear legs, side view	**0,0**
9. Rear legs, back rear view	-0,3
10. Hock quality	0,0
11. Bone quality	0,1
12. Foot angle	0,0
14. Fore udder attachment	-0,8
15. Rear udder height	-0,2
16. Rear udder width	0,3
17. Udder cleft/support	0,0
18. Udder depth	**-2,6**
19 Teat length	0,6
20 Teat thickness	0,8
21 Teat placement (front)	0,0
22. Teat placement (back)	-0,1
23. Udder balance	0,0

. . . . .

Difference between 1st to 5nd parity	Used Nordic
1. Stature	1,4
2. Body depth	1,8
3. Chest width	0,9
4. Dairy form	0,6
5. Top line	0,0
6. Rump width	0,5
7. Rump angle	0,0
8. Rear legs, side view	**0,0**
9. Rear legs, back rear view	-0,6
10. Hock quality	0,0
11. Bone quality	0,1
12. Foot angle	0,0
14. Fore udder attachment	-1,7
15. Rear udder height	-1,0
16. Rear udder width	-0,1
17. Udder cleft/support	0,0
18. Udder depth	**-3,5**
19 Teat length	0,7
20 Teat thickness	0,8
21 Teat placement (front)	0,0
22. Teat placement (back)	-0,1
23. Udder balance	0,0
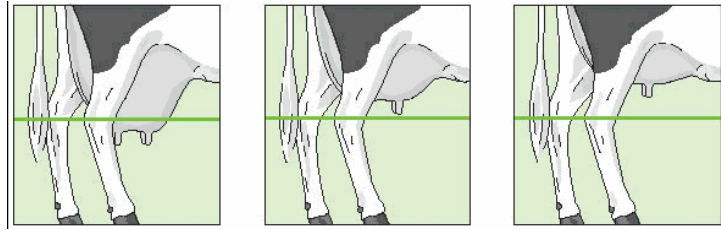
Months from calving - RDC
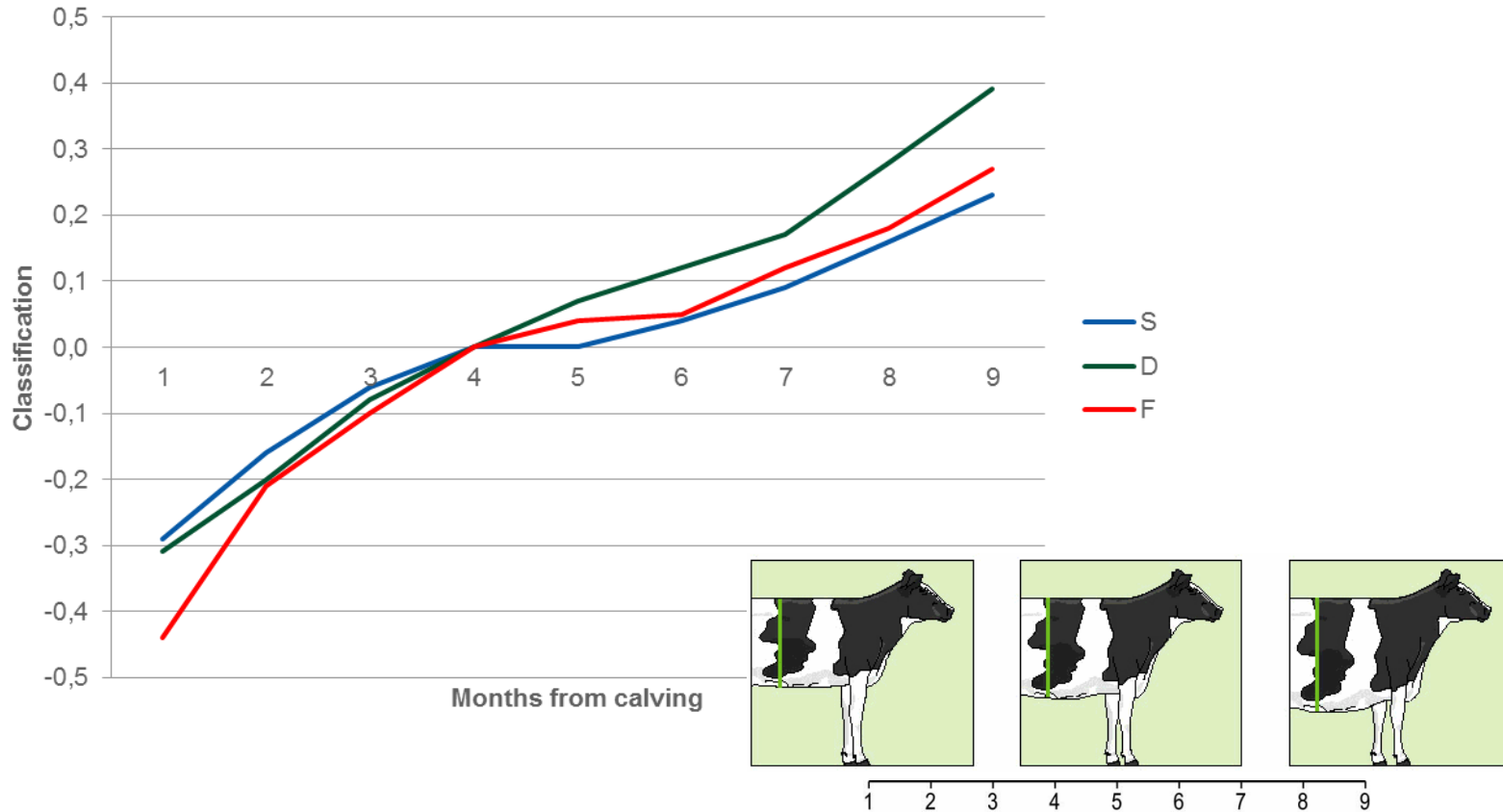
Months from calving - RDC
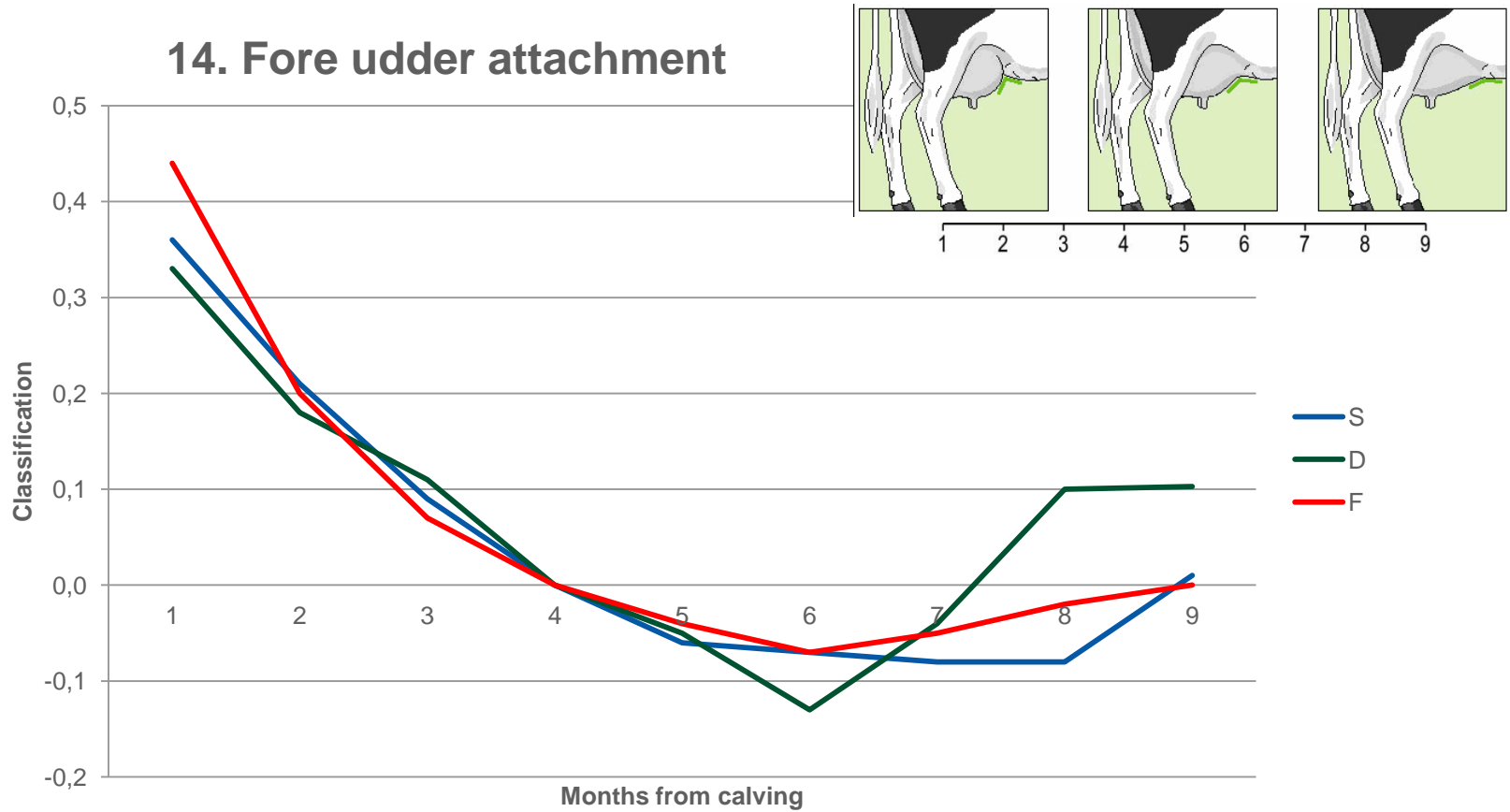
Corrections for months from calving - RDC

	1st	Later
1. Stature	**0,10**	**0,00**
2. Body depth	0,08	0,04
3. Chest width	0,07	0,05
4. Dairy form	0,00	-0,06
5. Top line	0,00	0,00
6. Rump width	0,03	0,00
7. Rump angle	0,00	0,00
8. Rear legs, side view	0,00	0,00
9. Rear legs, back rear view	-0,05	-0,05
10. Hock quality	0,00	0,00
11. Bone quality	0,00	0,00
12. Foot angle	**0,00**	**0,00**
14. Fore udder attachment	-0,04	0,00
15. Rear udder height	-0,05	-0,10
16. Rear udder width	-0,05	-0,10
17.Udder cleft/support	0,06	0,00
18. Udder depth	-0,10	0,00
19 Teat length	0,00	0,00
20 Teat thickness	0,00	-0,04
21 Teat placement (front)	0,08	0,04
22. Teat placement (back)	0,10	0,05
23. Udder balance	0,00	0,00

Hours from milking - HOL
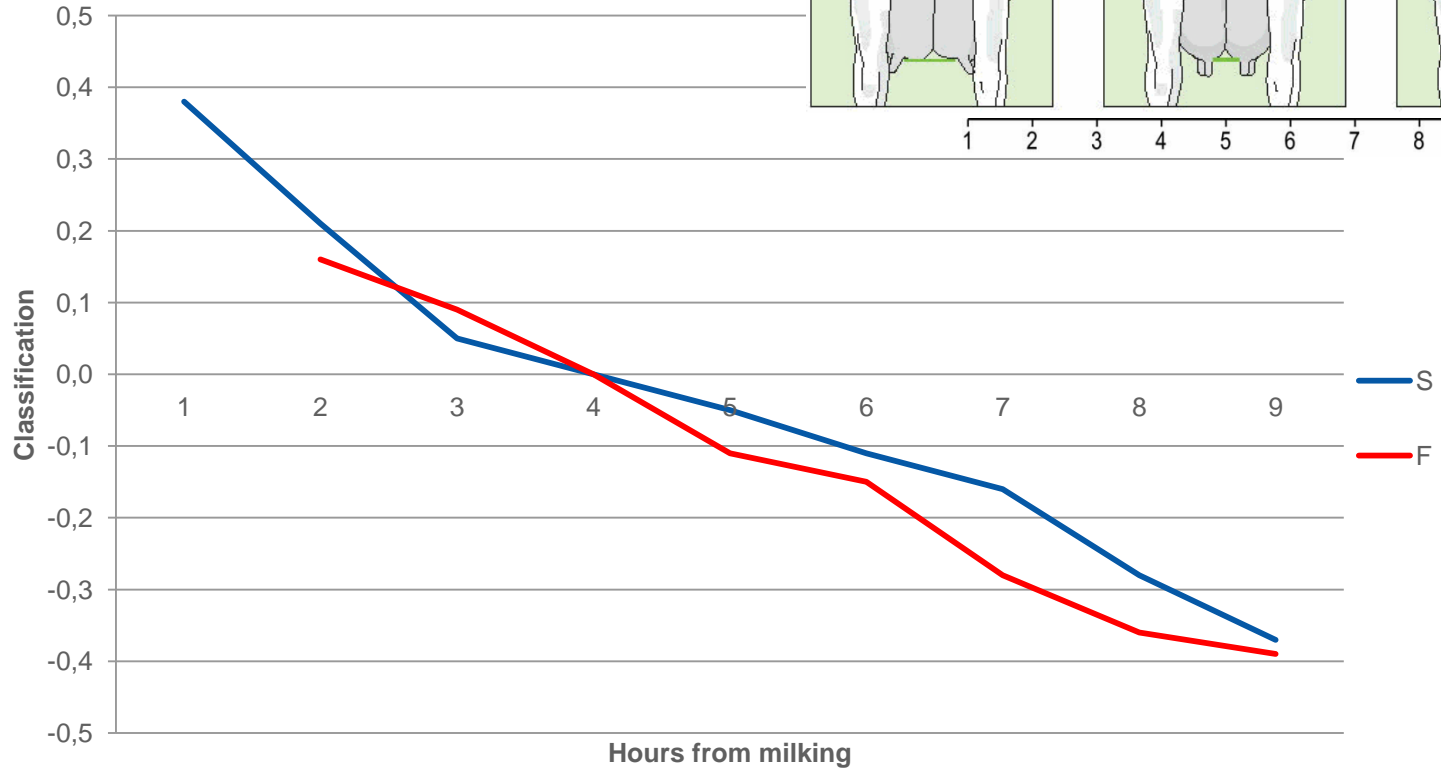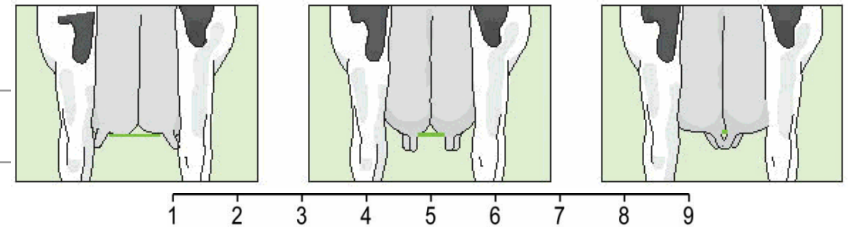
Corrections for hours from milking - RDC

	1. lact.	Later lact.
1. Stature	0,00	0,00
2. Body depth	0,00	0,00
3. Chest width	0,00	0,00
4. Dairy form	0,00	0,00
5. Top line	0,00	0,00
6. Rump width	0,00	0,00
7. Rump angle	0,00	0,00
8. Rear legs, side view	-0,04	-0,04
9. Rear legs, back rear view	0,08	0,08
10. Hock quality	0,00	0,00
11. Bone quality	0,00	0,00
12. Foot angle	0,00	0,00
15. Rear udder height	0,09	0,12
16. Rear udder width	0,10	0,14
20 Teat thickness	0,05	0,06
21 Teat placement (front)	-0,05	0,00
22. Teat placement (back)	-0,07	0,00

How a cow is corrected - F&L

- **Born** **1. August 2009**
- **Calving** **1. August 2011**
- **Classified** **1. January 2012**

- **RDC**
- **1. calver**
- **24 months old at calving**
- **5 months between calving and classification**
- **5 hours between milking and classification**

Classification

	Class.				
Rear legs, side	5				
Rear legs, back	8				
Hock quality	7				
Bone quality	8				
Foot angle	6				

Correction

9. Rear legs, back

	Class.	Dist. calv			
Rear legs, side	5	-			
Rear legs, back	8	0,05 x 1			
Hock quality	7	-			
Bone quality	8	-			
Foot angle	6	-			
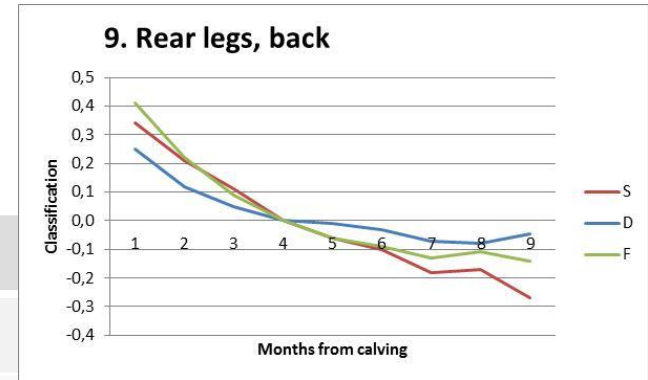
Distance from calving: 5 months → 4 months
(0,05 point pr. month)

Correction^{continued}

	Class.	Dist. calv	Calv. age		
Rear legs, side	5	-	-		
Rear legs, back	8	0,05 x 1	-		
Hock quality	7	-	-		
Bone quality	8	-	-0,03 x 4		
Foot angle	6	-	-		
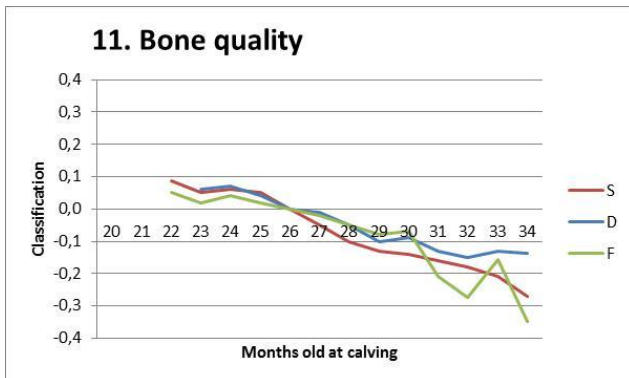
11. Bone quality

Calving age: 24 months → 28 months
(0,03 point pr. month)

Correction^{continued}

	Class.	Dist. calv	Calv. age	Dist. Milk.	
Rear legs, side	5	-	-	**-0,04 x 2**	
Rear legs, back	8	0,05 x 1	-	**0,08 x 2**	
Hock quality	7	-	-		
Bone quality	8	-	-0,03 x 4		
Foot angle	6	-	-		

Distance from milking: 5 hours → 7 hours

9. Rear legs, back

Classification vs Hours from calving

Correction^{continued}

	Class.	Dist. calv	Calv. age	Dist. Milk.	Korr.
Rear legs, side	5	-	-	-0,04 x 2	4,92
Rear legs, back	8	0,05 x 1	-	0,08 x 2	8,21
Hock quality	7	-	-		7
Bone quality	8	-	-0,03 x 4		7,88
Foot angle	6	-	-		6

Correction – special case 1
Not a 1. lactation cow, but a cow in 4. lactation

	Class.	Dist. calv	Calv. age	Dist. Milk.	Korr.
Rear legs, side	5	-	-	-0,04 x 2	4,92
Rear legs, back	8	0,05 x 1		0,08 x 2	8,21
Hock quality	7	-			7
Bone quality	8	-	-0, x 4		7,88
Foot angle	6	-	-		6

Correction – special case 1

Not a 1. lactation cow, but a cow in 4. lactation

	Class.	Dist. calv	Parity	Dist. Milk.	Korr.
Rear legs, side	5	-	-	-0,04 x 2	4,92
Rear legs, back	8	0,05 x 1	0,4	0,08 x 2	8,61
Hock quality	7	-	-		7
Bone quality	8	-	-0,1		7,9
Foot angle	6	-	-		6

Rest of the procedure is the same!

Correction – special case 2
Focus on time from milking

"En ko som har fått 555545 5555 får juver 76 9 timmar efter mjölkning. Om jag sätter 1 timme efter mjölkning får hon 78. Varför?"

Correction – special case 2
Focus on time from milking

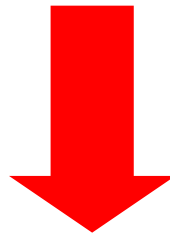|	Class	1 hour	9 hour	Opt.	Effect "1 hour"
Rear udder height	5	+0,54	-0,18	9	++
Rear udder width	5	+0,60	-0,20	9	++
Teat thickness	5	+0,30	-0,10	6	++
Teat place. (front)	5	-0,30	0,10	8	- -
Teat place. (back)	5	-0,42	0,14	5	- -

Classified one hour from calving gives higher udder score – under the assumption that they are classified equally

Procedure in "machine"

Classification

⬇

Correction

⬇

Calculation of section of traits and final score

Calculation of section of traits

Distance from optimum$_{trait}$ x weight$_{trait}$

Summed up for all traits

Calculation of section of traits – F&L

	Corrected class.	Optimum	Vægt	Dev.
Rear legs, side	**4,92**	4,5 - 5	21	**0**
Rear legs, back	**8,21**	8	21	**0,044**
Hock quality	**7**	9	16	**0,320**
Bone quality	**7,88**	7,5	16	**0,060**
Foot angle	**6**	7,0	16	**0,160**
Sum				**0,584**

Calculation of section of traits^{Continued}
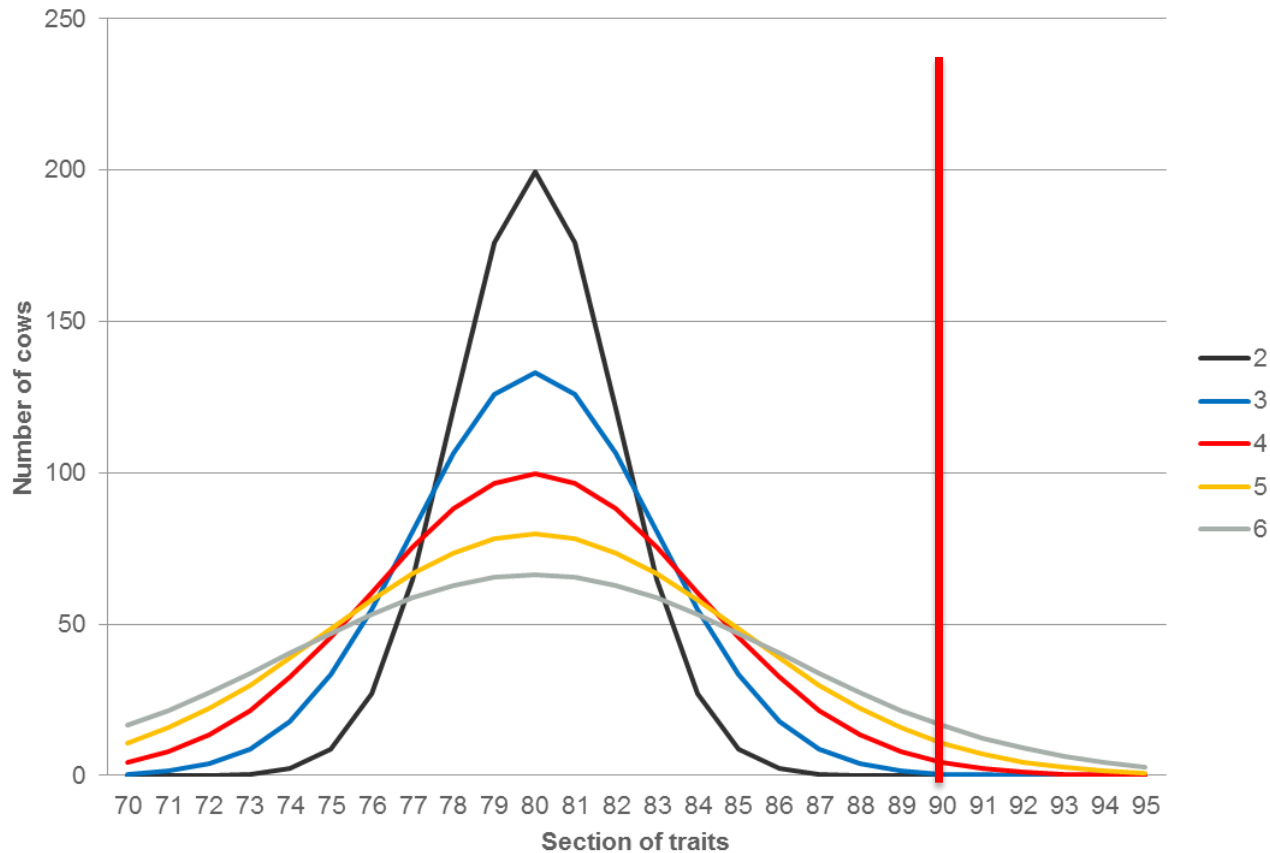
(Average - sum of deviations)

x

STD + 80

Standardization of average and standard deviation on the basis of latest classified animals

Average

- Average must always be 80!

- Easy for farmer to understand and use

Calculation of section of traits – F&L

(**1,638** – 0,584) x **11,278** + 80 = 91,8

Corrects average to 80   **Corrects STD to 5**

Cow gets 92 in feet&legs

Calculation of final score

Final score =   (Body – 80) x weight
**   + (F&L – 80) x weight**
**   + (udder – 80) x weight)**

**   x Standardization of STD + 80**

Calculation of final score

Final score =   **(92 – 80) x 0,3**

                  + (92 – 80) x 0,3

                  + (92 – 80) x 0,4

                  x 1,15 + 80

                  = 93,8

Cow gets 94 in total score

Why use a standardization factor of 1,15
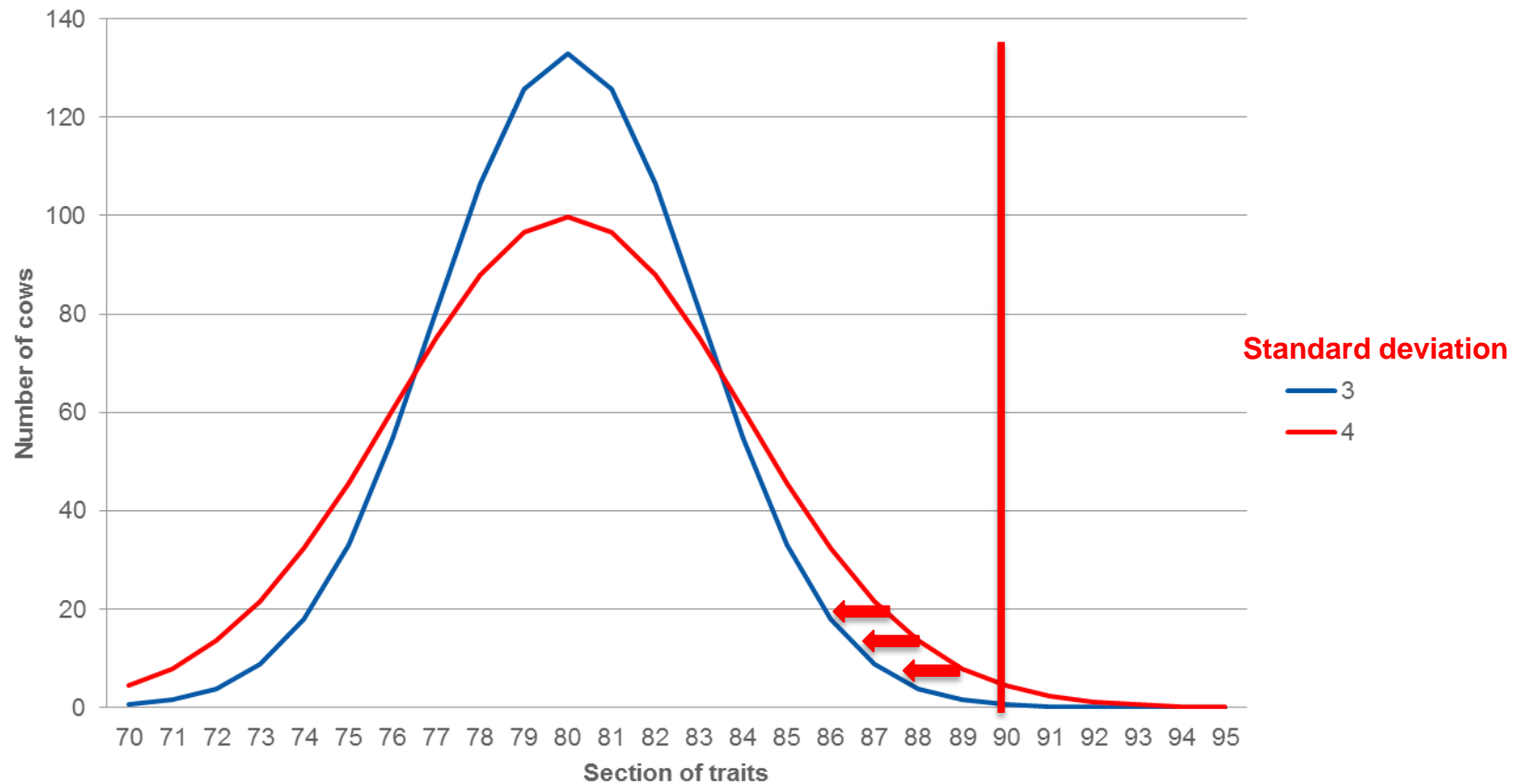
Miss Holstein 2005

Frequency of cows being good for both body, F&L and udder is low!