How to combine linear udder traits in Udder

Anders Fogh, Emma Carlén, Terhi Vahlsten, Ulrik Sander Nielsen, Jukka Pösö, Jan-Åke Eriksson, Gert Pedersen Aamand

Outline

- Which value do Udder have and weight in NTM
- Which trait are important – in relation to work, udder health and longevity
- How can we combine traits in Udder to get most value - alternative combinations – “the best recipe”

Weight on Udder in NTM

What carries the value of a good udder – present situation?

Less work

Better health

More beautiful cows

Longer living cows

Weight on Udder in NTM

What carries the value of a good udder - ideal situation?

Less work Udder

Better health mastitis

Longer living cows

Longevity

More beautiful cows no value

Handling of Udder in NTM report in 2008?

From NAV report

- The basic economic assumptions was (subjective) assessment of the extra work-load in an average herd.
- Extra work was assumed to be 15 minutes per day per 70 cows if all traits in Udder were linearly scored 1 point away from the optimum
- Note (almost) entirely costs related to work was included – all value related to longevity and health was included in economic value of longevity and health

Handling of Udder in NTM report in 2008?

Conclusion from NAV workshops

- All breeds found that longevity and udder health would have an increased value in the future
- All breeds wished to put more weight on Udder than in the NAV report of three major reasons:
  - A good udder essential with increasing yield
  - Important to get acceptance of NTM in practice
  - Give indirect increase in longevity and udder health

All other traits got weights very close to NAV report

All breeds want high weight in NTM!

	Holstein	RDC	Jersey	Red Holstein
Suggestion	0.09	0.13	0.13	
Oct 2008	0.18	0.32	0.15	0.24
Current	0.25	0.32	0.26	0.24

Today all breeds put more than double weight on Udder compared to pure economic weight in the original proposal

Extra work load can NOT justify this large weight!!

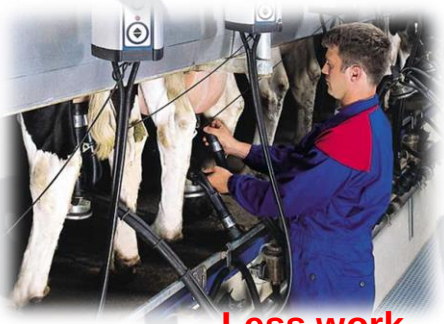
Which way to go?

- Present weight
  - Udder: mixture of work, health, longevity, beauty and …..
  - Not precisely optimized in any way
- Less weight on udder
  - Put weight directly on health and longevity instead
  - Udder is pure work
- Present weight - optimize udder

Talk about this way to go today!

  - Udder: mixture of work, health and longevity
  - Optimized for those traits – highest value per index unit
  - Double counting! – but that was also the case before

Which linear traits gives most value?



Less work

Better health

Longer living cows

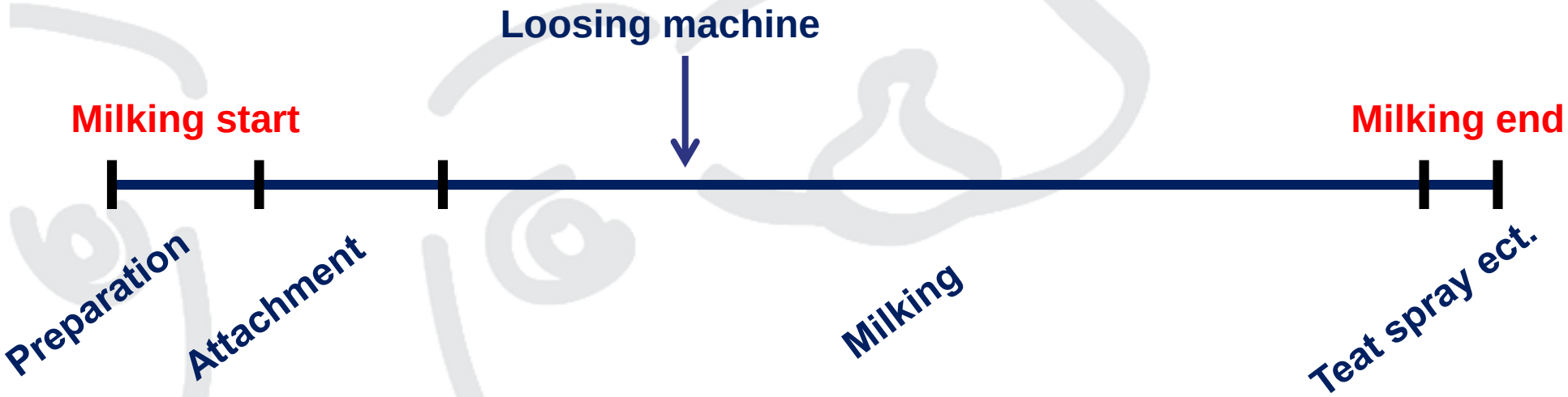
No good objective measure

- **Your opinion?**
- **Data from AMS?**

Index for udder health

Index for longevity

Less work: Value of traits in Udder



- **How clean is the udder** (fore udder attachment, udder depth)
- **How fast can you put on the machine** (teat placement)
- **Do cow loose machine during milking** (teats, udder balance)
  - Largely affected by right settings of hoses and liners

Value of traits on udder health and longevity

- What is the effect if EBV changes from 80 to 120 for:
  - Present index for Udder
  - Udder health
  - Longevity
  - Milking speed

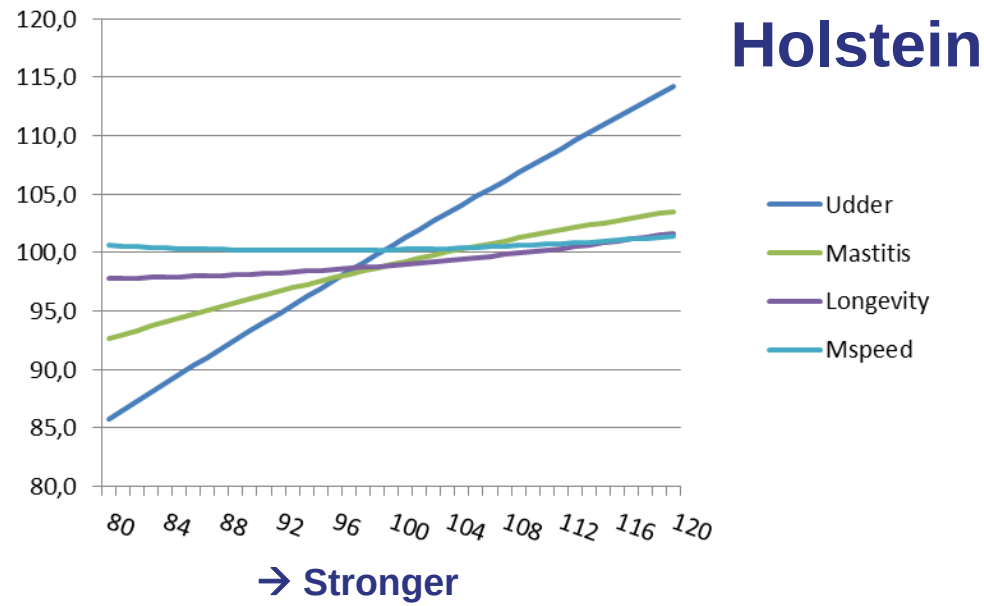
Shown for Holstein and RDC

Higher index for fore udder attachment

What happens to other traits?

- Important trait
- Going in right direction today

NAV advice: include in udder!



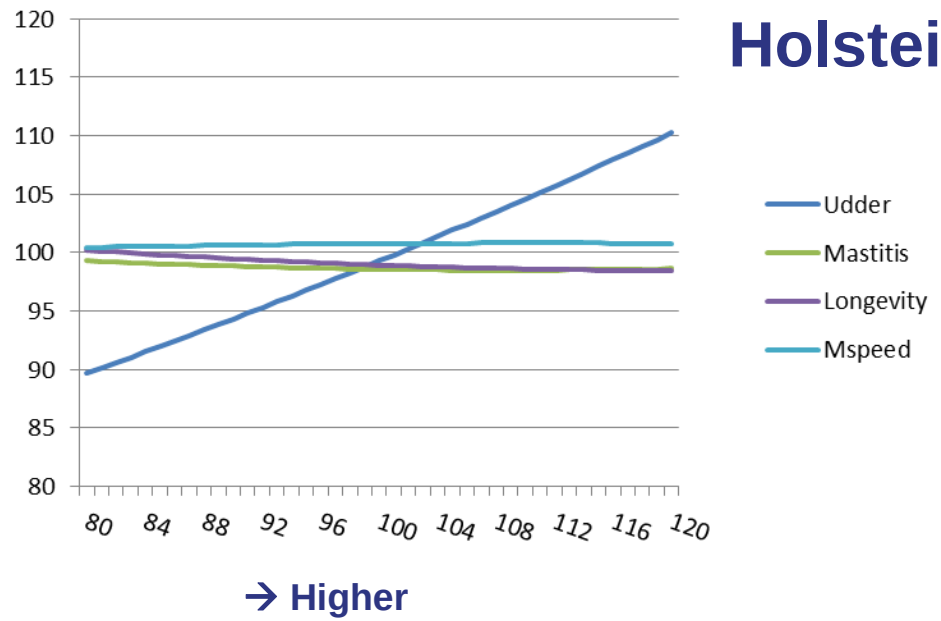
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	28.5***	10.9***	3.8***	0.8
RDC	25.2***	10.5***	6.1***	3.1*

Higher index for rear udder height

What happens to other traits?

- Not important trait

NAV advice: not include in udder!



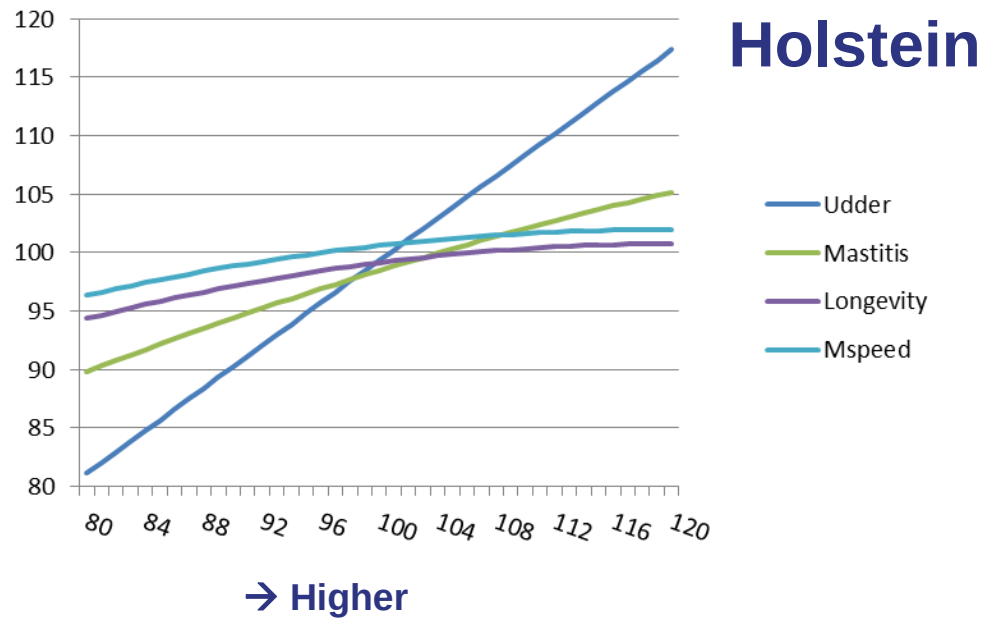
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	20.6***	-0.7	-1.8	0.4
RDC	19.3***	0.6	2.9	-1.1

Higher index for udder depth

What happens to other traits?

- Important trait
- Going in right direction today

NAV advice: include in udder!



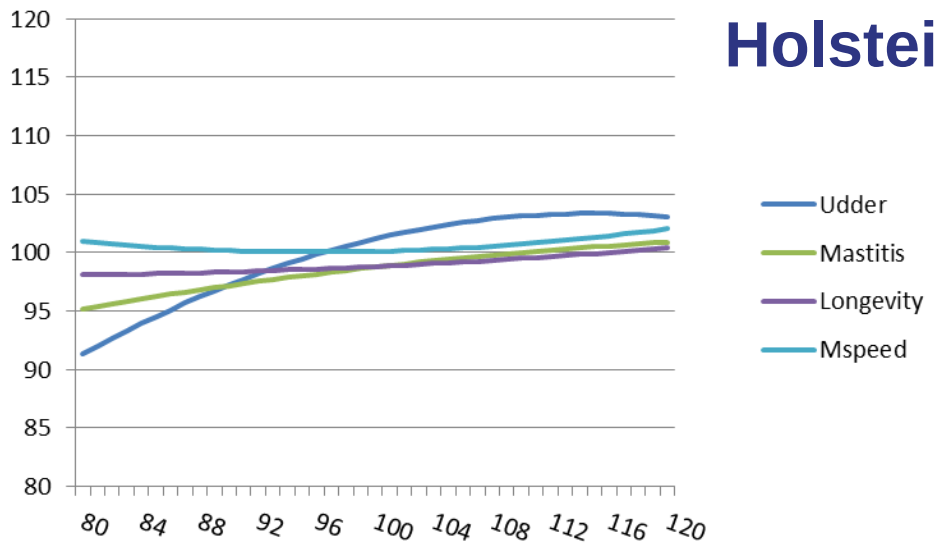
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	36.2***	15.3***	6.4***	5.6***
RDC	30.6***	14.8***	8.2***	4.6*

Higher index for udder balance

What happens to other traits?

- Not important trait
- HOL in DK: deep fore udders is a problem

HOL farmer wish: include in udder



→ More deep fore udders

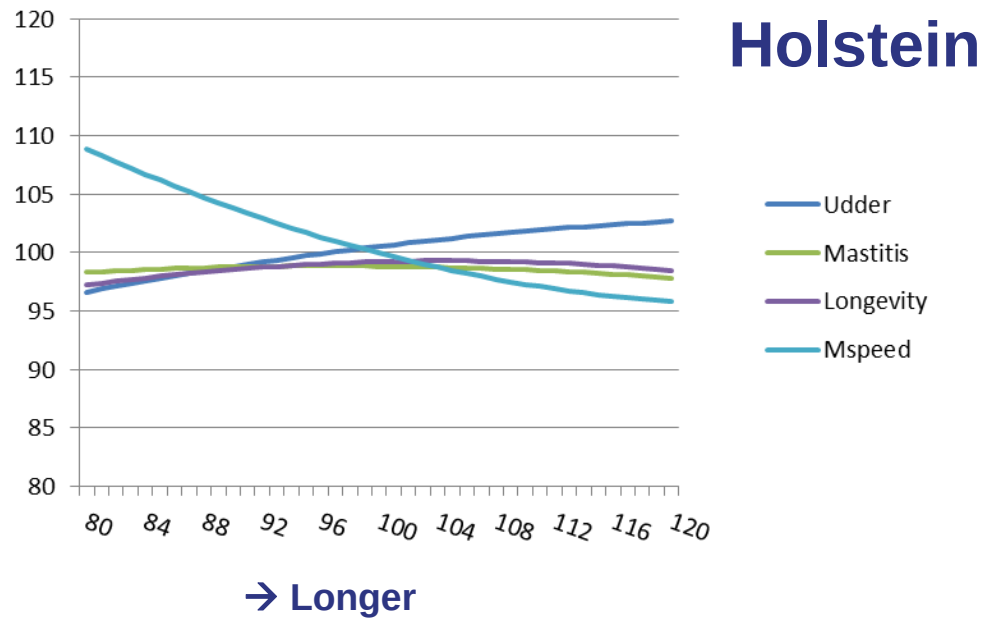
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	11.8***	5.7***	2.3	1.1
RDC	15.7***	3.6	-0.5	3.8*

Higher index for teat length

What happens to other traits?

- Not important trait
- going in ”wrong” direction

NAV advice: If included in udder – shorter teats



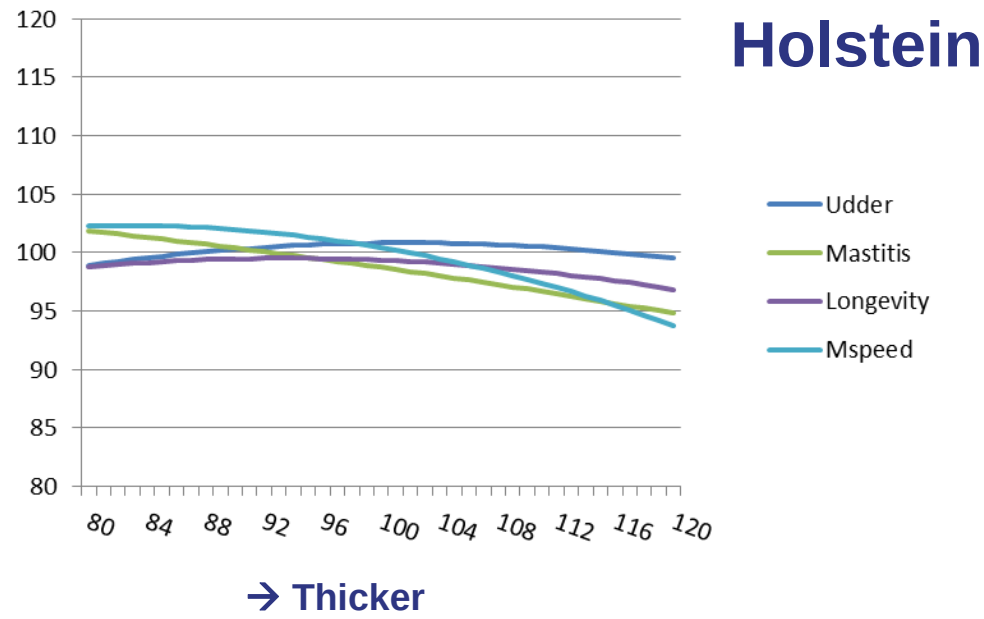
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	6.0***	-0.5	1.3	-13.0***
RDC	12.0***	-0.2	-6.8***	-8.2***

Higher index for teat thickness

What happens to other traits?

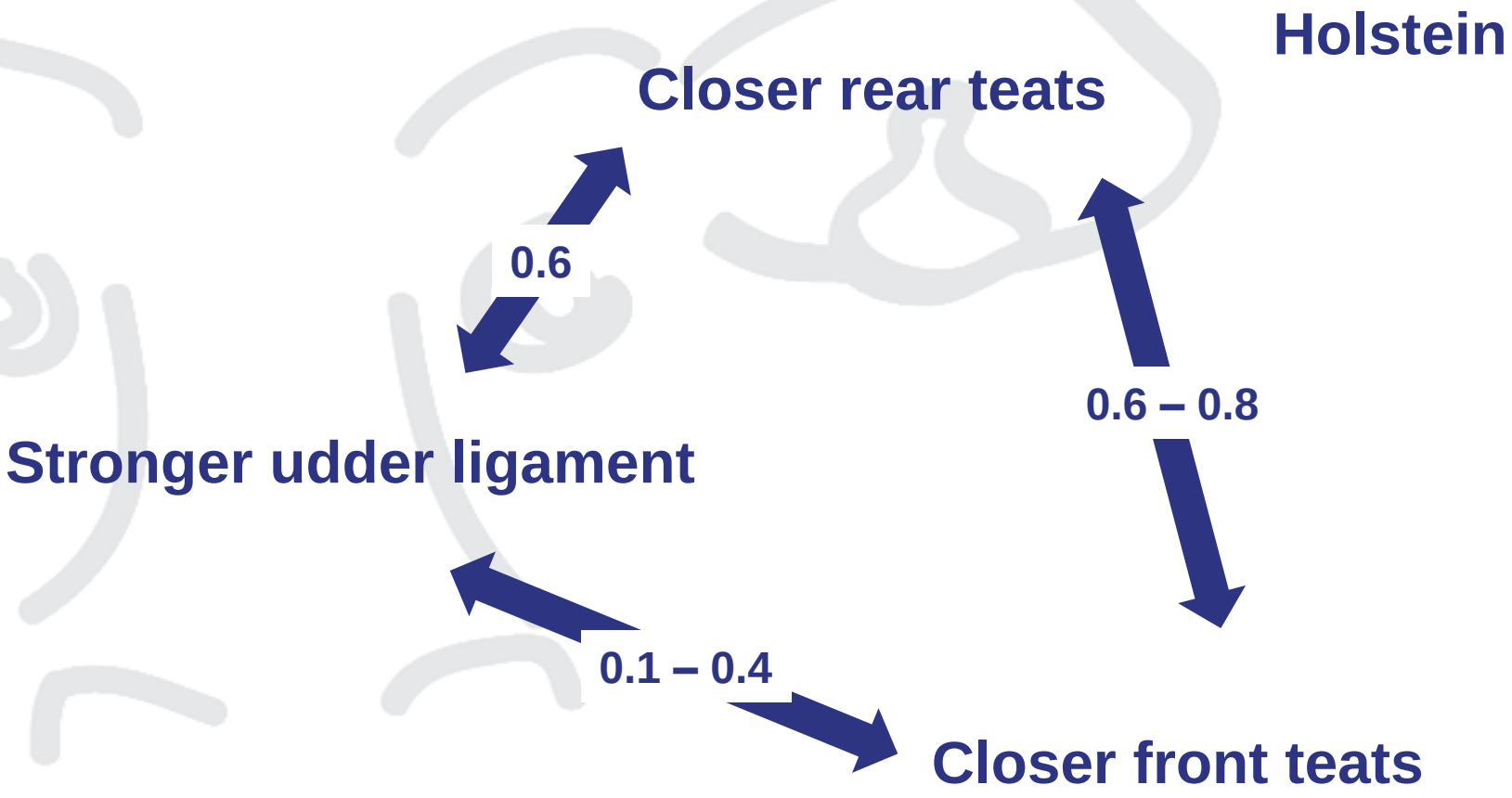
- Important trait
- Wrong/no direction today

NAV advice: If included in udder – thinner teats



Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	0.6	-7.1***	-2.0	-8.5***
RDC	8.6***	-6.4***	-6.2***	-5.3***

Teat placement and udder cleft

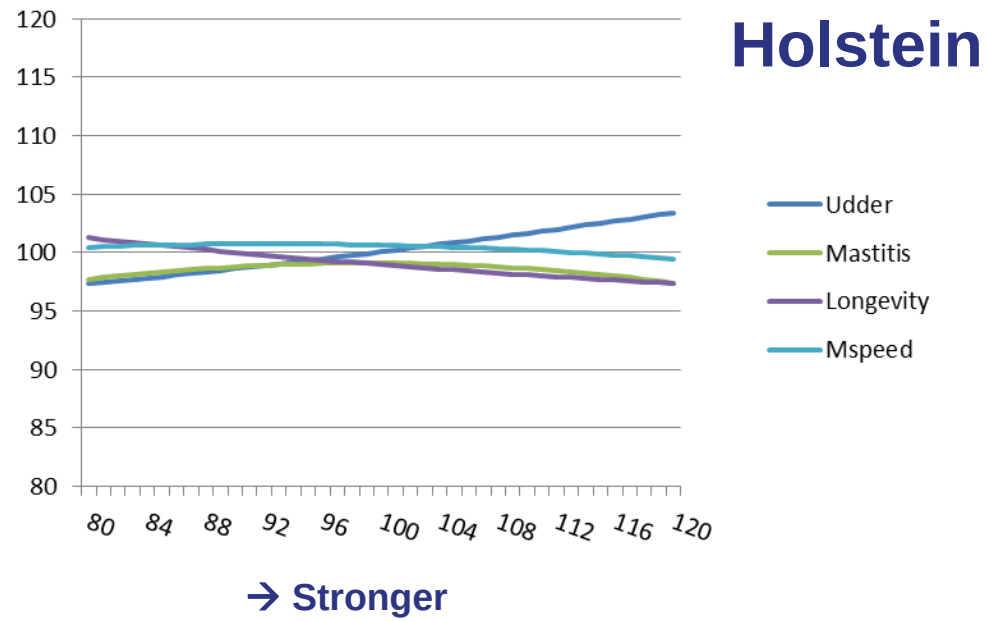


Higher index for udder cleft

What happens to other traits?

- **Not important trait – unexpected!**

HOL farmer wish: include in udder



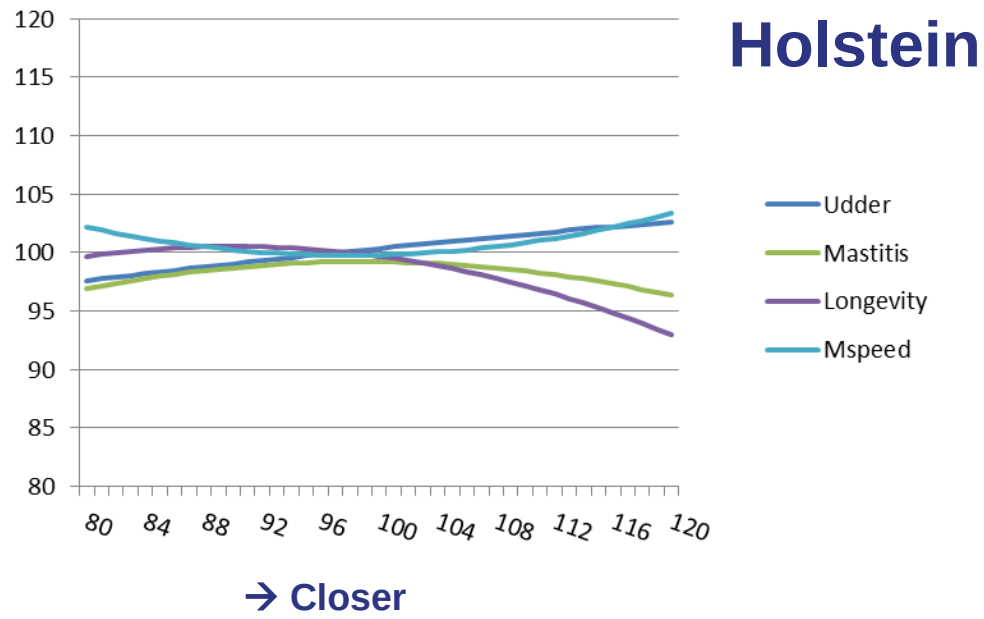
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	6.1***	-0.3	-3.9***	-1.0
RDC	10.0***	1.9	2.7*	-0.3

Higher index for front teat placement

What happens to other traits?

- Important trait

NAV advice: not include in udder - weight instead on rear teat plac.



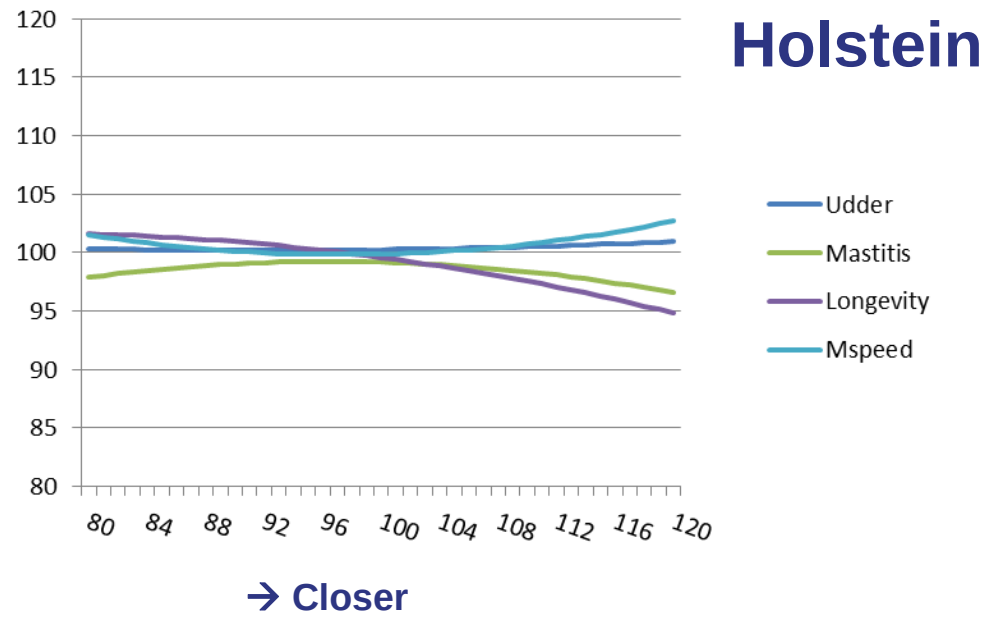
Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	5.0***	-0.6	-6.7***	1.2
RDC	12.6***	5.3***	3.2*	3.1

Higher index for rear teat placement

What happens to other traits?

- Fairly important trait

NAV advice: include in udder for HOL!



Index units	Udder	Mastitis	Longevity	Mspeed
Holstein	0.6	-1.3	-6.8***	1.2
RDC	8.0***	3.5*	2.3	2.4

Summary: functional Udder index

- Value is related to work used for milking, udder health and longevity
- Traits with optimal influence on health and longevity
  - Fore udder attachment (HOL + RDC)
  - Teat thickness (HOL + RDC)
  - Udder depth (HOL + RDC)
  - Teat placement, back (HOL)
- Same as the ones which influence work used for milking?

HOL farmer wish:
- **Udder cleft**
- **Udder balance**

Alternative weights

- NAV has analyzed different alternatives to illustrate the effect of different weights on linear udder traits
  - Holstein – 3 alternatives
  - RDC – 3 alternatives
  - Jersey – decision has been made

Alternatives illustrate different correlation to health/longevity (RDC + HOL) and wishes from breed (HOL)

RDC

Weight factors udder three alternatives

Traits	Current	I	II	III
Fore udder attachment	20	10	5	5
Rear udder height	8			
Rear udder width	5			
Udder cleft	12		5	5
Udder depth	20	30	30	30
Teat length	10			-8
Teat thickness	10			-8
Teat placement, front	10			
Teat placement, back	5	Close back teats are not as big a problem as for Holstein		
Udder balance	0			

RDC

Correlations between Udder and udder traits for three alternatives

Traits	Current	I	II	III
Fore udder attachment	0,69	0,69	0,58	0,50
Rear udder height	0,45	0,28	0,29	0,24
Rear udder width	0,35	0,15	0,14	0,12
Udder cleft	0,24	0,08	0,25	0,24
Udder depth	0,71	0,97	0,98	0,91
Teat length	0,42	-0,05	-0,07	-0,39
Teat thickness	0,27	-0,19	-0,21	-0,52
Teat placement, front	0,32	0,21	0,23	0,26
Teat placement, back	0,23	0,13	0,23	0,25
Udder balance	0,34	0,33	0,35	0,30
Udder health	0,26	0,40	0,41	0,40
Longevity	0,06	0,18	0,19	0,25
Milking speed	-0,02	0,10	0,10	0,16
Y-index	-0,20	-0,21	-0,22	-0,16
NTM	0,22	0,24	0,25	0,24
Current udder		0,78	0,77	0,52

Genetic progress for RDC
- going from present to scenario III

- Fore udder attachment, rear udder height, rear udder width: Still progress – but less – same direction
- Udder cleft, teat placement, front and back: Less in I going to same as present in III – same direction
- Udder depth: More – same direction
- Teat length and thickness: Reverse → thinner and shorter
- Same for udder balance

Holstein

Weight factors udder three alternatives

Traits	Current	I	II	III
Fore udder attachment	17	15	15	15
Rear udder height	10			
Rear udder width	0			
Udder cleft	10	15	15	15
Udder depth	24	30	40	35
Teat length	5			
Teat thickness	5			
Teat placement, front	7			
Teat placement, back	-12	-25	-25	-25
Udder balance	-10	-15	-5	-10

*** Opposite of health/longevity results**

Holstein

Correlations between Udder and udder traits for three alternatives

Traits	Current	I	II	III
Fore udder attachment	0,72	0,59	0,64	0,63
Rear udder height	0,50	0,23	0,35	0,30
Rear udder width	0,29	0,13	0,15	0,14
Udder cleft	0,15	0,03	0,05	0,05
Udder depth	0,88	0,77	0,90	0,85
Teat length	0,17	0,06	0,05	0,05
Teat thickness	0,05	-0,06	-0,09	-0,08
Teat placement, front	0,15	-0,16	-0,11	-0,14
Teat placement, back	0,01	-0,29	-0,20	-0,24
Udder balance	0,24	-0,09	0,21	0,08
Udder health	0,36	0,37	0,41	0,40
Longevity	0,15	0,20	0,22	0,21
Milking speed	0,01	0,04	0,05	0,05
Y-index	-0,21	-0,19	-0,22	-0,21
NTM	0,28	0,32	0,32	0,33
Current udder		0,86	0,93	0,91

Genetic progresse for Holstein
- going from present to scenario III

- Fore udder attachment, rear udder height, rear udder width Still progress – but less – same direction
- Udder cleft : Less than before – almost none
- Teat placement, front and back: Reverse → wider between teats
- Udder depth, teat length and thickness: Same
- Varying for udder balance – due to varying weight factors

Jersey

Current and futur weight factors

Traits	Previous	Present
Fore udder attachment	25	20
Rear udder height	5	
Rear udder width		
Udder cleft		10
Udder depth	35	25
Teat length	3	
Teat thickness	12	
Teat placement, front	15	
Teat placement, back		-10
Udder balance		-10

Summary - overall

- Present weight on udder conformation in NTM is higher than justified by economic considerations → more value in udder index
- Traits and weights on alternatives are different than present udder index - aiming at a more functional udder
- Importance and direction of improving udder traits has generally same effect on BOTH health and longevity – probably also workload