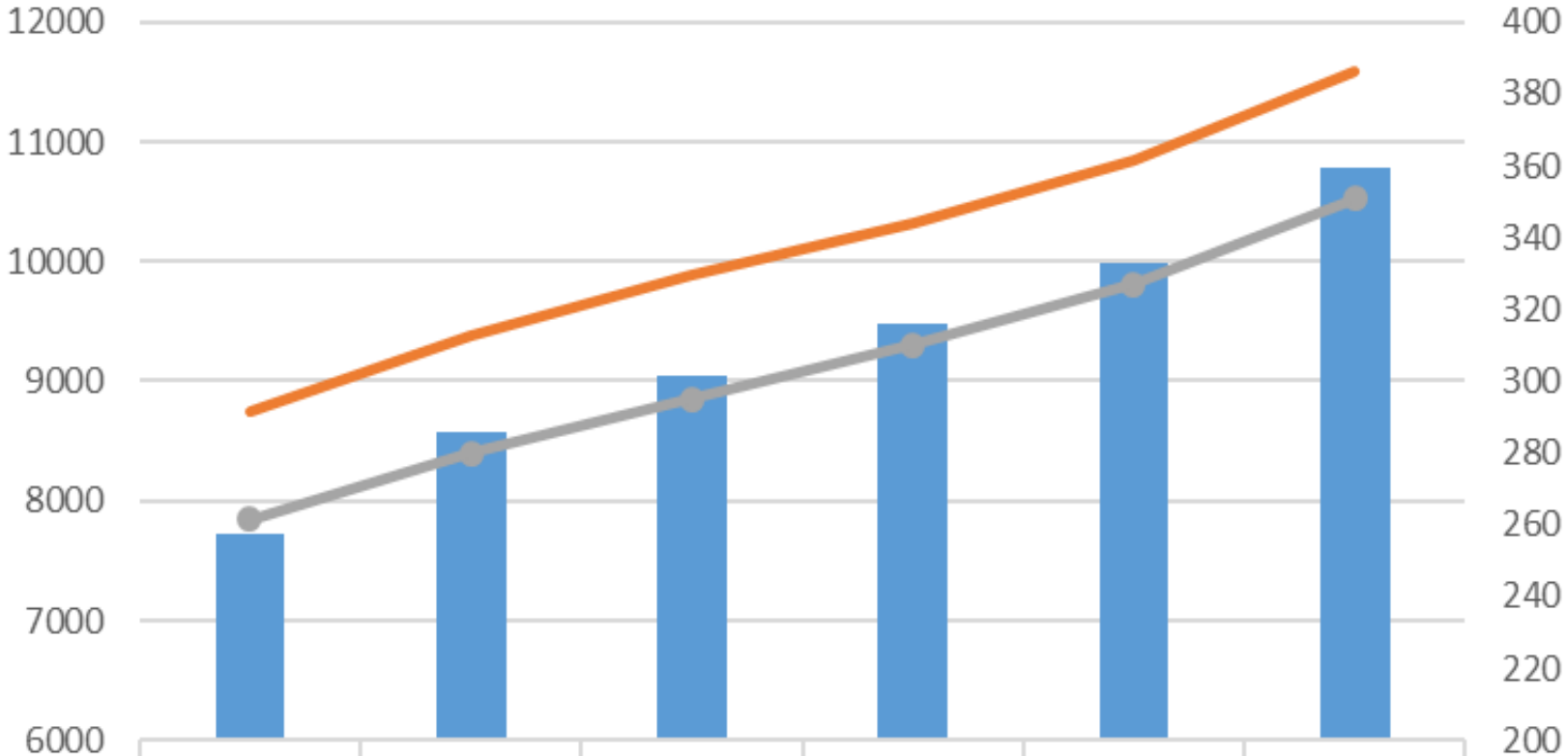
Linear traits and their influence on cows

General considerations on the use of conformation data for longevity, lifetime productiuon and health traits

(ICAR resources, 2022)

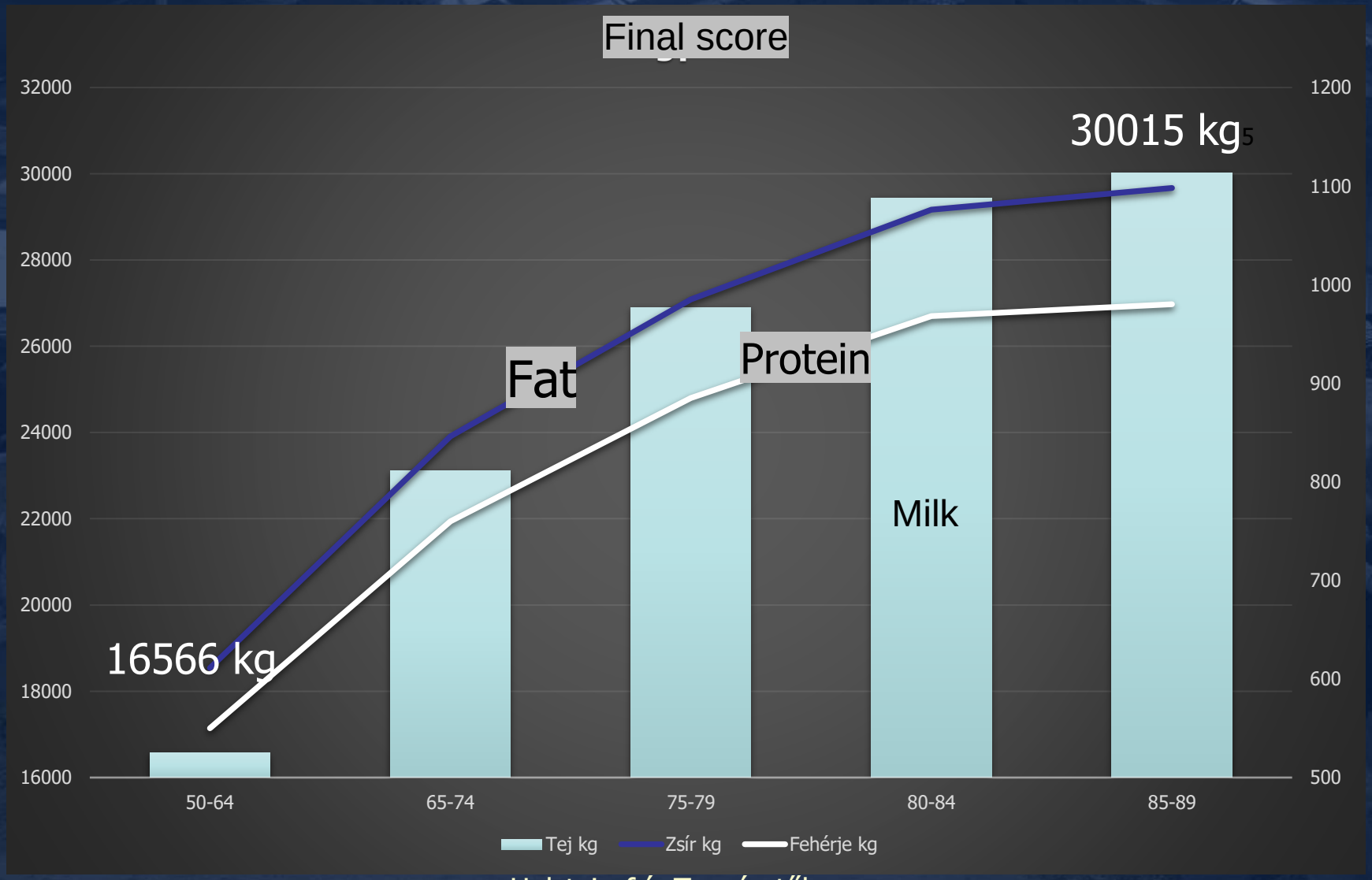
The relationship between the standard lactation of first lactation cows and their final classification points

(136 000 cows, 2014-2017)



	60-64	65-69	70-74	75-79	80-84	85-89
Milk kg	7728,78	8581,65	9039,73	9474,43	9988,66	10784,51
Fat kg	291,55	312,79	329,81	344,23	361,5	386,23
Protein kg	261,48	279,8	294,89	310,15	327,02	350,82

Lifetime production and Final score
(classified 1st calvers between 1999.01.01. - 2014.12.31. ~455 000 cows)



ICAR Conformation Recording Working Group

The group made a research about the relationship between Conformation and Functional linear traits

This information can be used to show farmers how the conformation scores can help him to breed a kind of cow which is able to perform the best in the herd.

The main purpose of the CR-WG is to achieve a number of objectives related specifically to conformation recording.

Members of the working Group:

Chairman: Gerben De Jong CRV, The Netherlands

Pierre Berrechet, IDELE, **France**
Jeffrey Bewley, Holstein Association, **USA**
Arnaud Delpeuch, IDELE, **France**
Timothée Neuenschwander, Holstein Switzerland, **Switzerland**
Thomas Pfaller, Bayerische Landesanstalt für Landwirtschaft (LfL) **Germany**
Mathijs van Pelt, CRV, **The Netherlands**
Tamas Sebok, Hungarian Holstein Association**, Hungary**

(Bernard Lutz, Germany)

The main purpose of the CR-WG is to achieve a number of objectives related specifically to conformation recording.

Relationship between Conformation and Functional traits

The analysis was made in 4 populations (3 dairy and 1 dual-purpose) coming from 4 countries (The Netherlands, Switzerland, Germany and Hungary). Only 1st lactation classifications were used for the analysis.

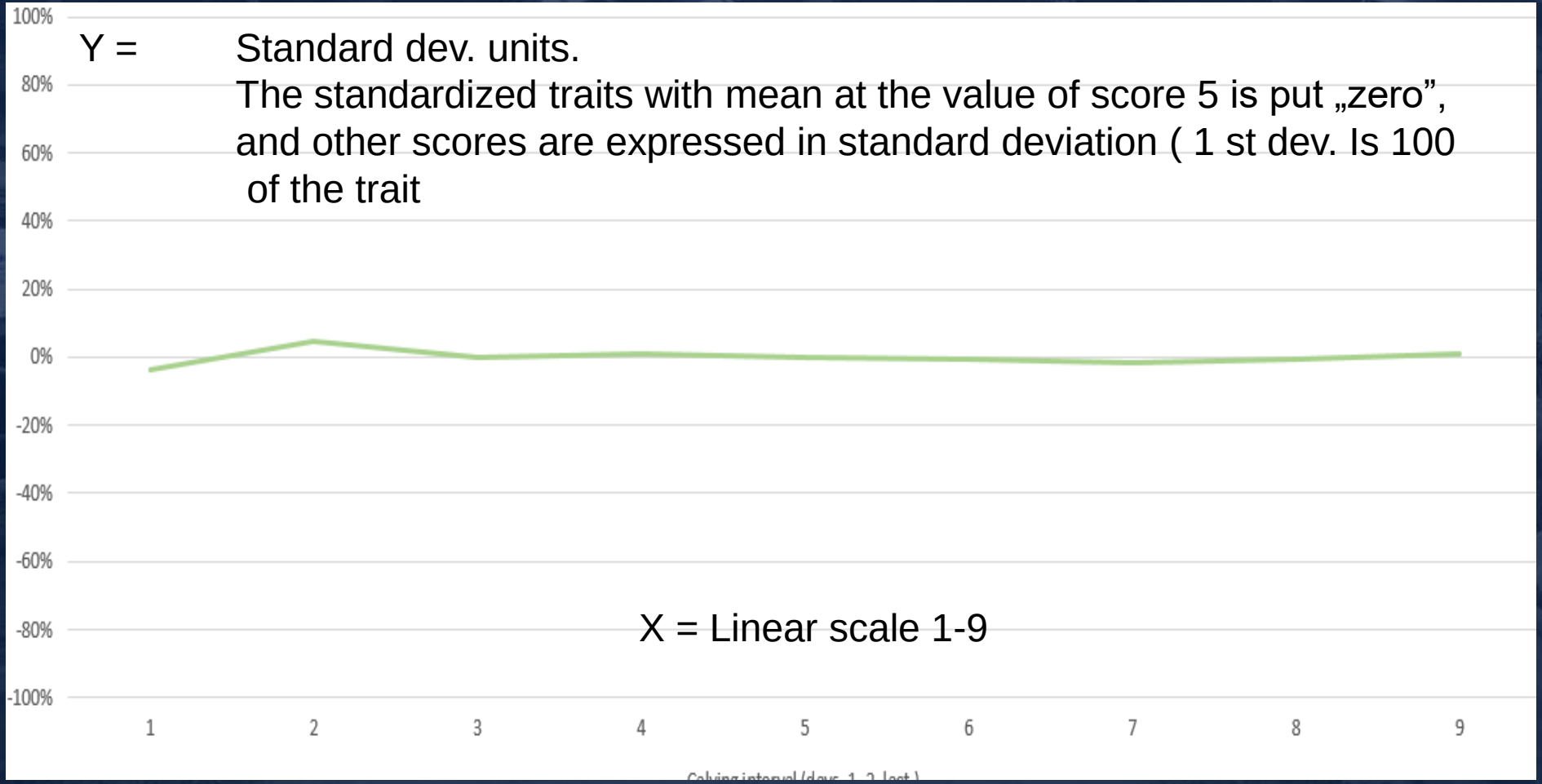
Relationship between Conformation and Functional traits

Results are presented as a deviation in percentage of the phenotypic standard deviation of 6 functional traits:

- **Lifetime production**: milk production during the whole productive life (117 000 cows)
- **Survival**: binary trait for reaching the 4th calving (111 000 cows)
- **Somatic cell count:** geometric mean of 1st lactation SCC (230 000 cows)
- **Claw disorders**: any disorder observed on the hoof for the disorders sole haemorrhage, digital dermatitis, interdigital dermatitis, sole ulcer, interdigital hyperplasia, and white line disease (44 000 cows)
- **Interval from 1st to last insemination**: interval in days between 1st to last insemination resulting in a gestation. (322 000 ows)
- **Calving ease**: calving score on a scale of 1 to 4 (easy to caesarean section) at the 1st calving. All animals in the analysis had the opportunity to have a productive life of at least 36 months. (138 000 cows)

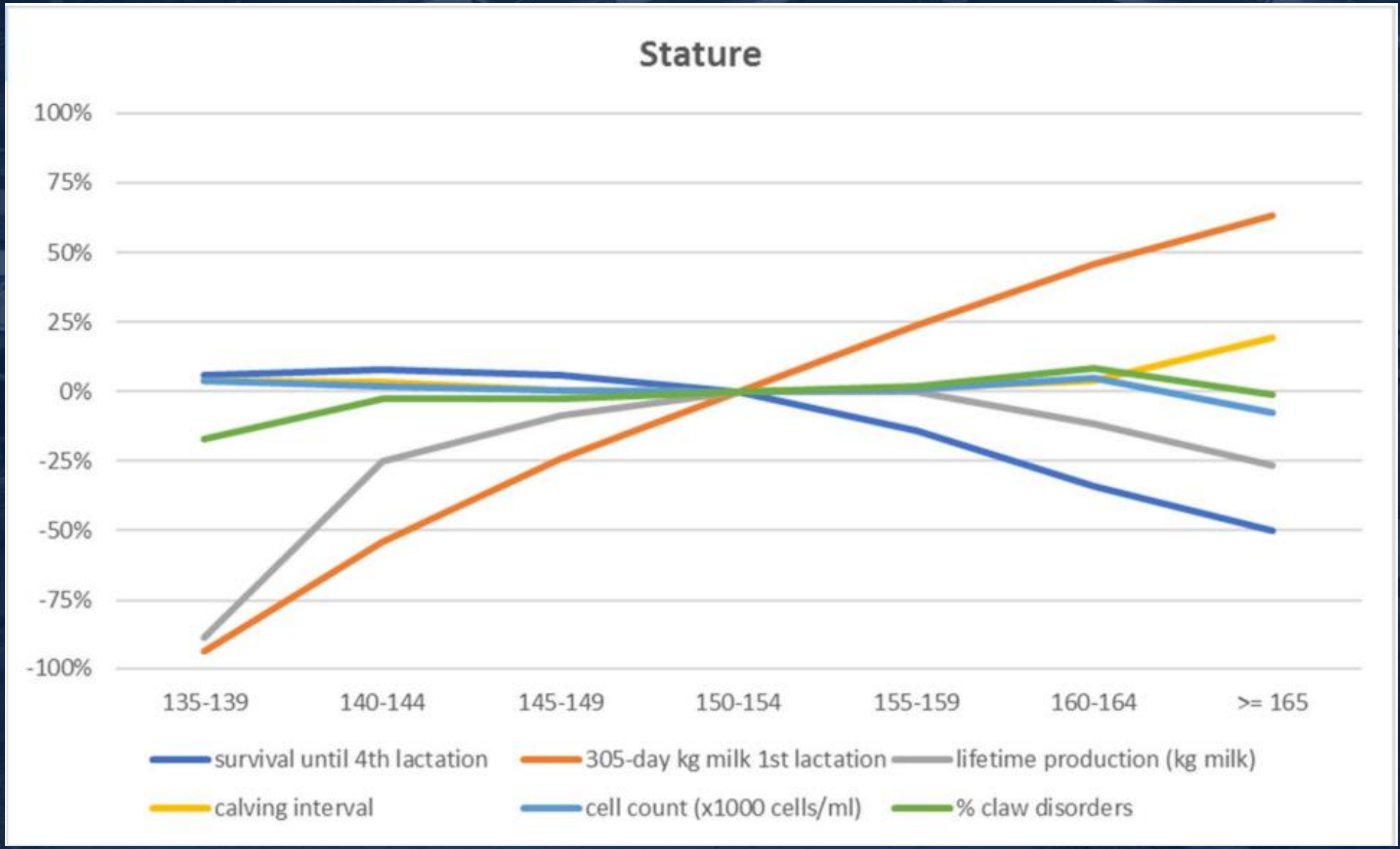
Y = Standard dev. units.

The standardized traits with mean at the value of score 5 is put „zero”, and other scores are expressed in standard deviation (1 st dev. Is 100 of the trait

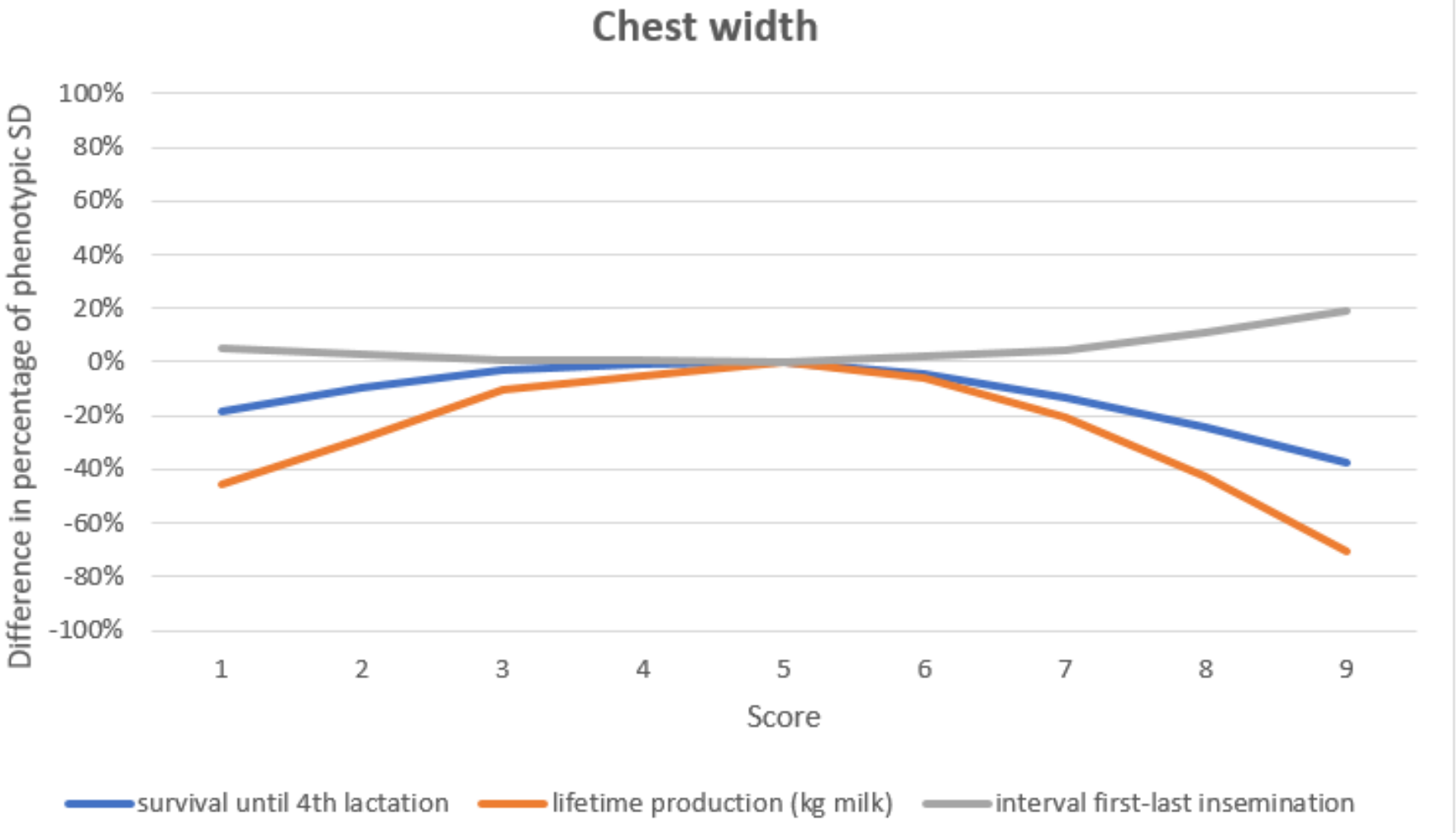


X = Linear scale 1-9

Stature


Stature
100%
75%
50%
25%
0%
-25%
-50%
-75%
-100%
135-139
140-144
145-149
150-154
155-159
160-164
>= 165
survival until 4th lactation
305-day kg milk 1st lactation
lifetime production (kg milk)
calving interval
cell count (x1000 cells/ml)
% claw disorders

Chest width


Chest width
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
2
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5
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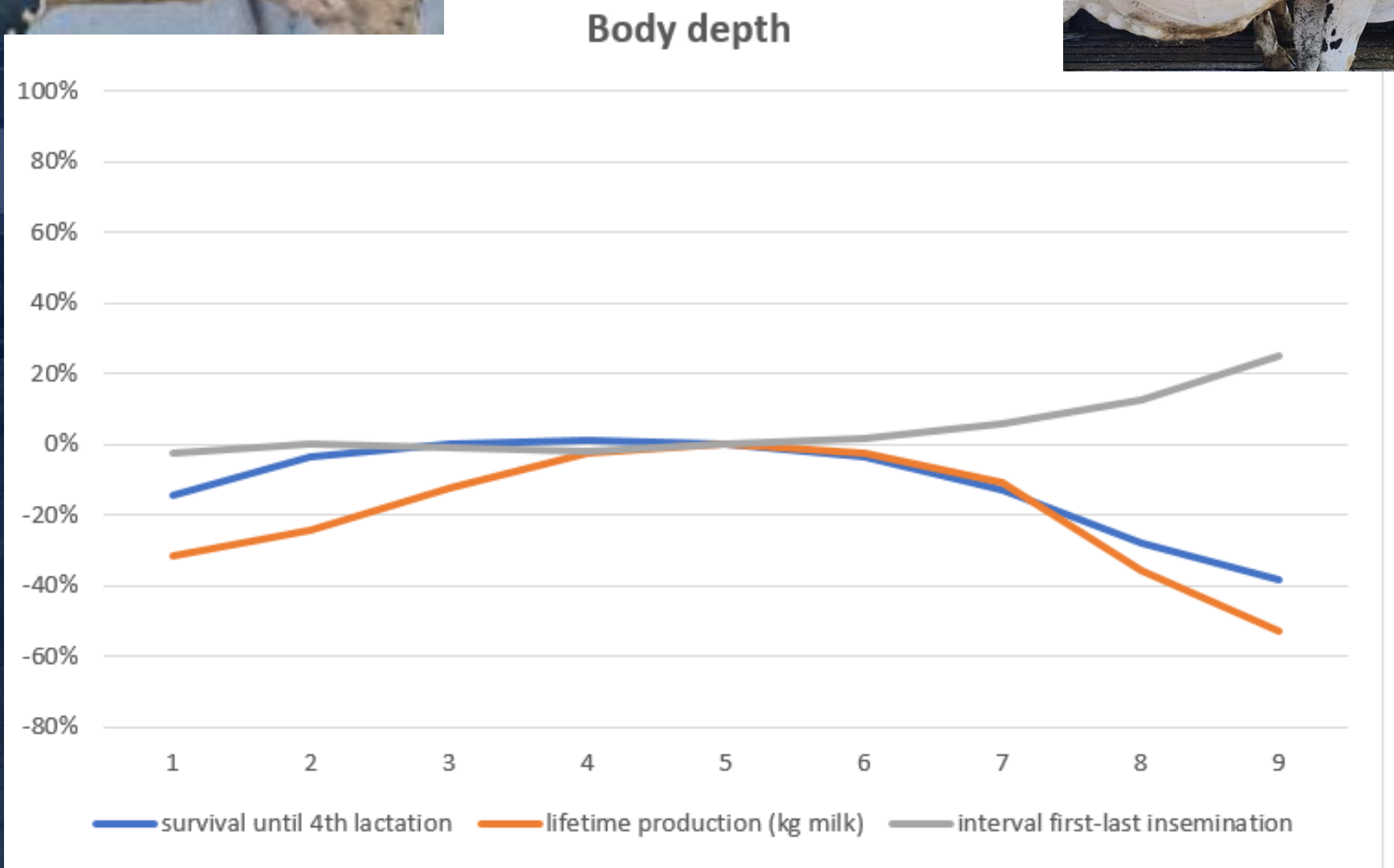
Score
survival until 4th lactation
lifetime production (kg milk)
interval first-last insemination

Body depth


Body depth
100%
80%
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40%
20%
0%
-20%
-40%
-60%
-80%
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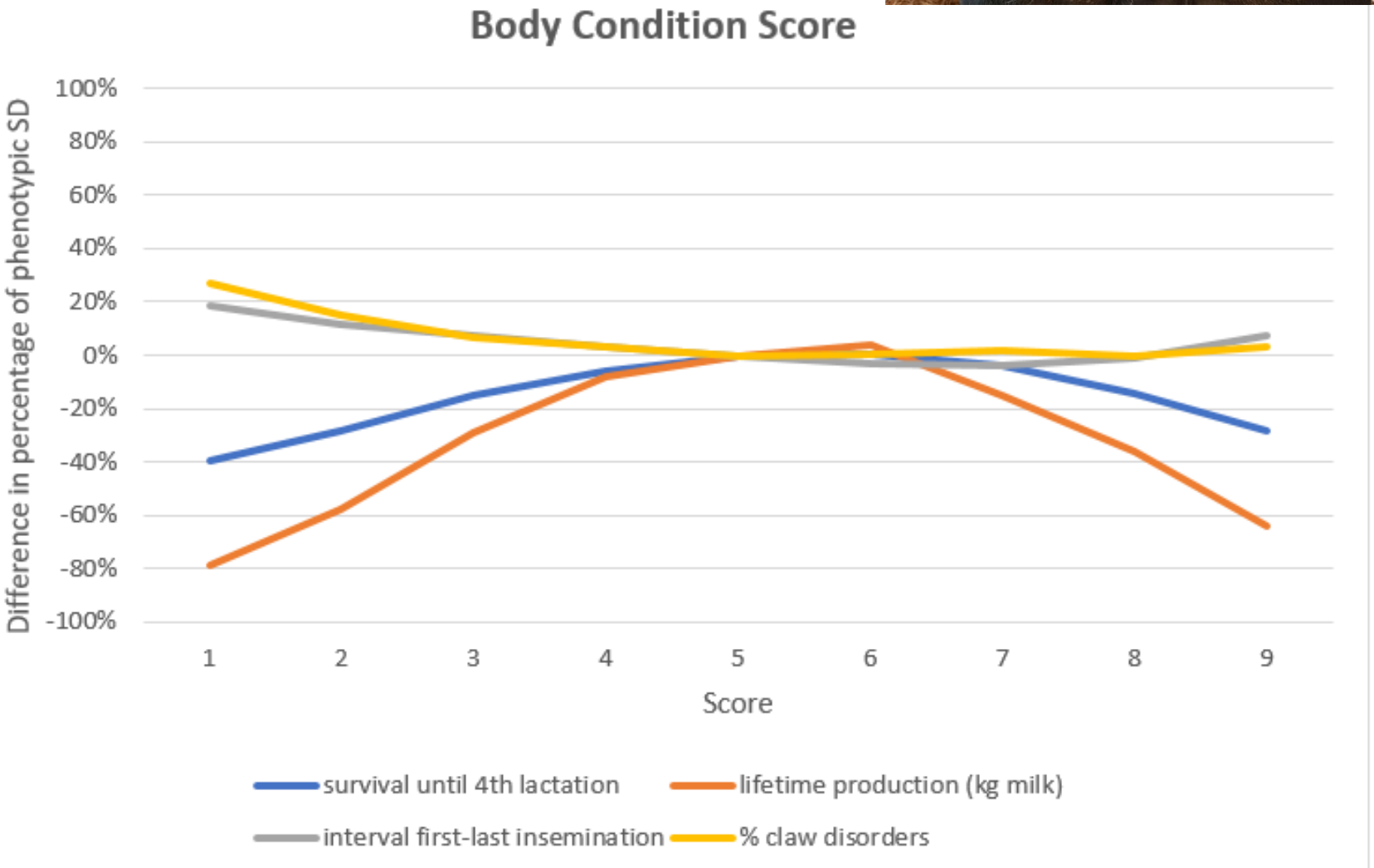
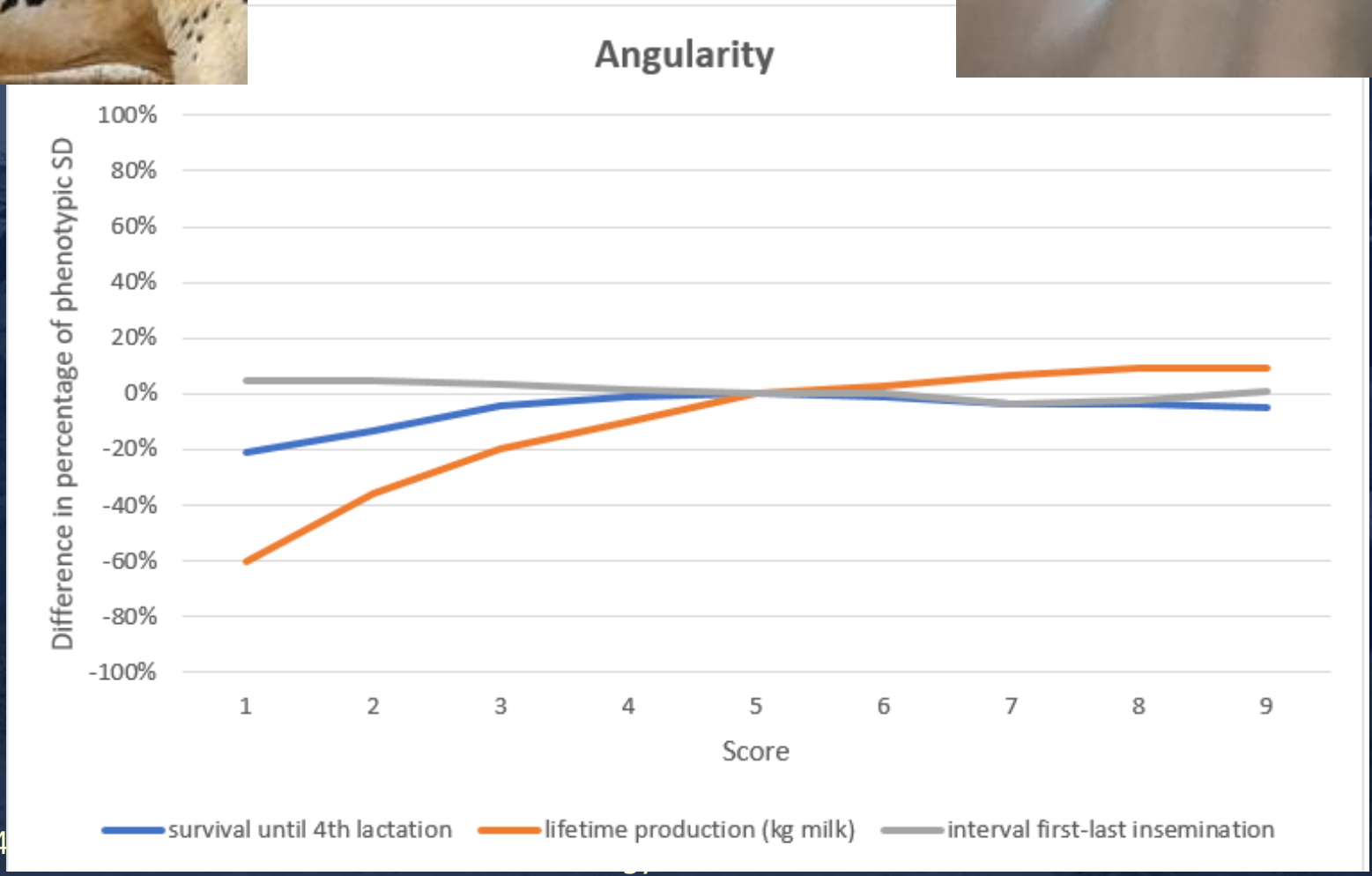
survival until 4th lactation
lifetime production (kg milk)
interval first-last insemination

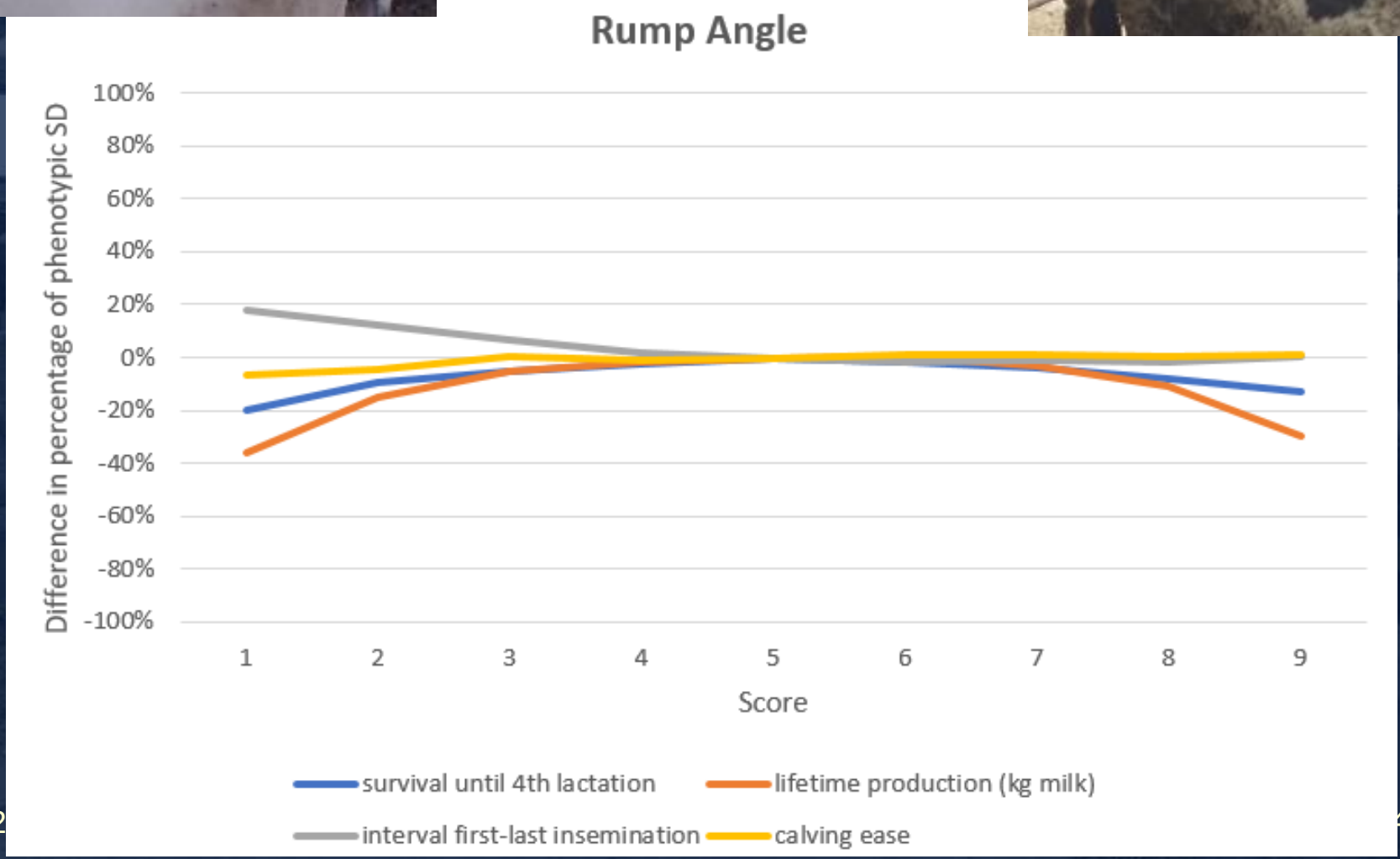
Body condition



Angularity (Ribs structure)



Rump angle


Rump Angle
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
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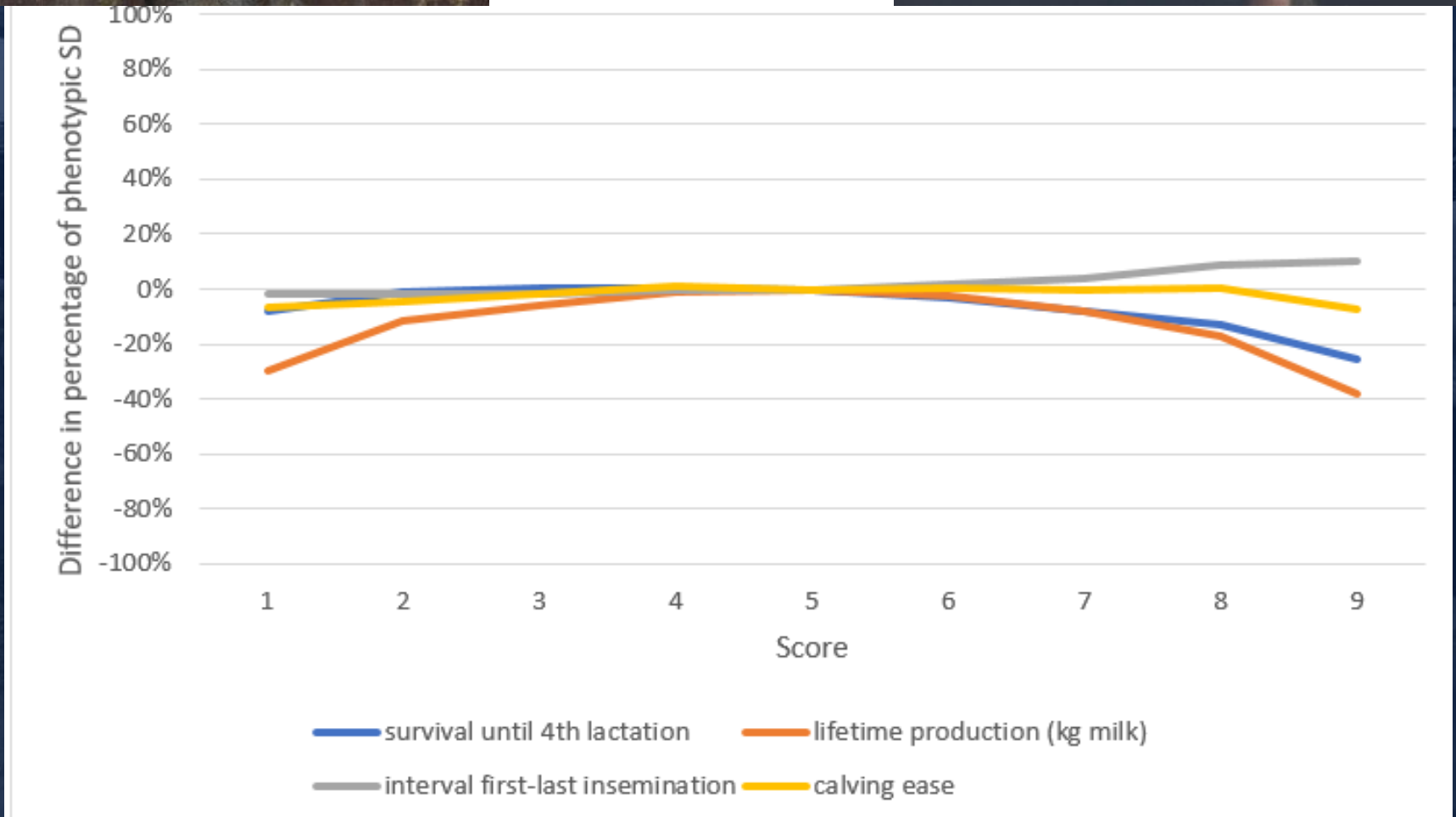
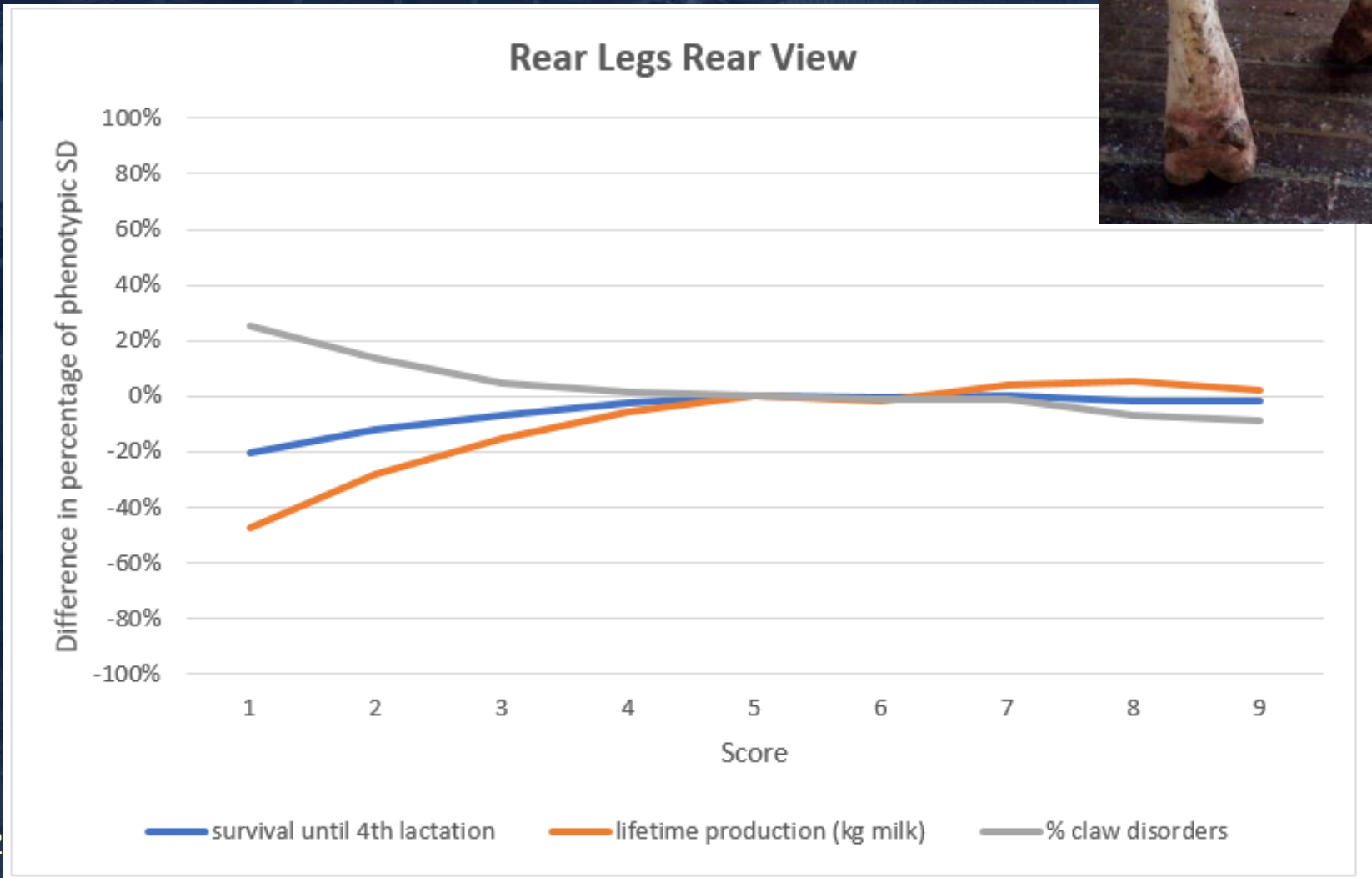
9
Score
survival until 4th lactation
lifetime production (kg milk)
interval first-last insemination
calving ease

Rump width

Rump Width

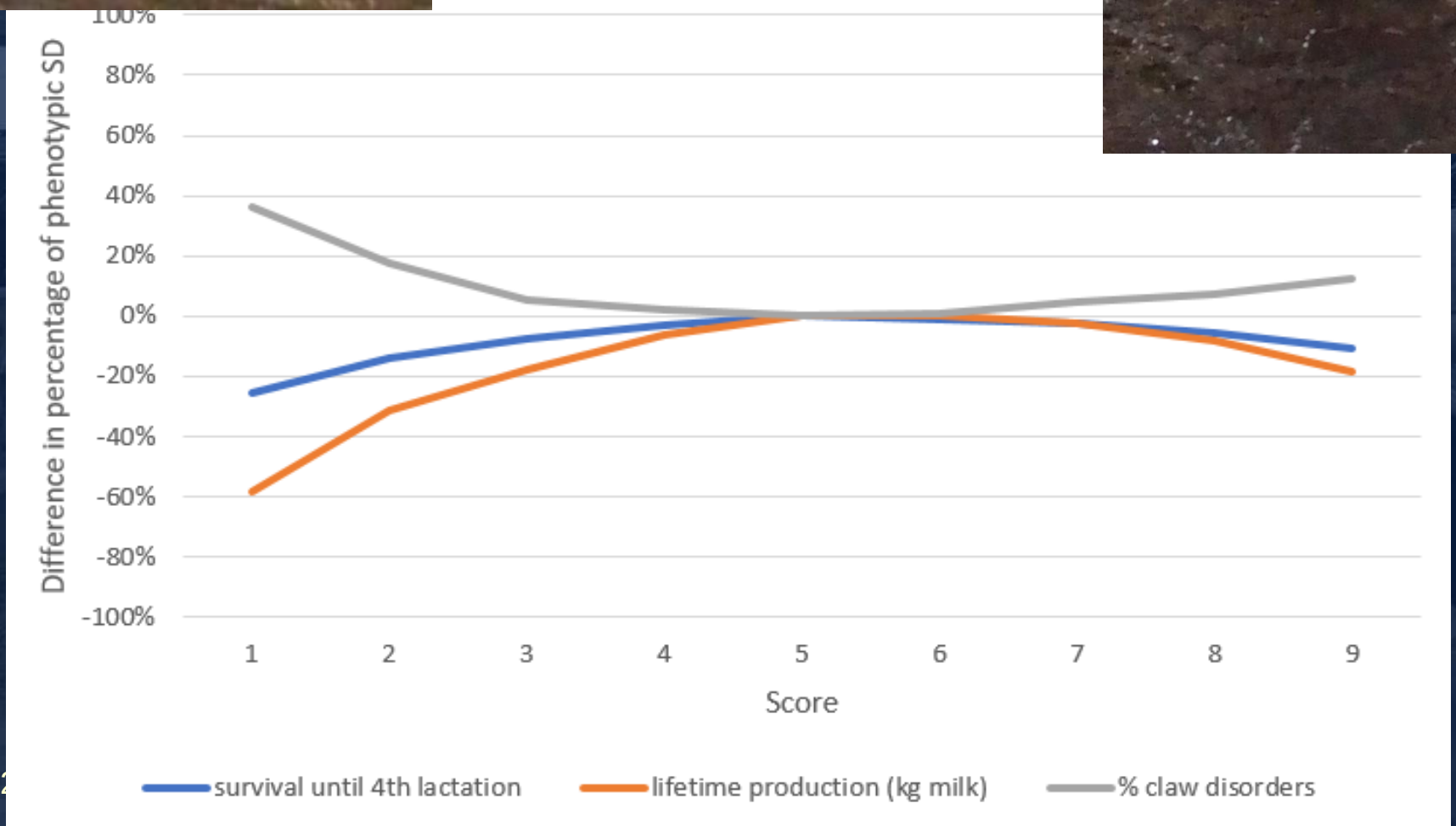


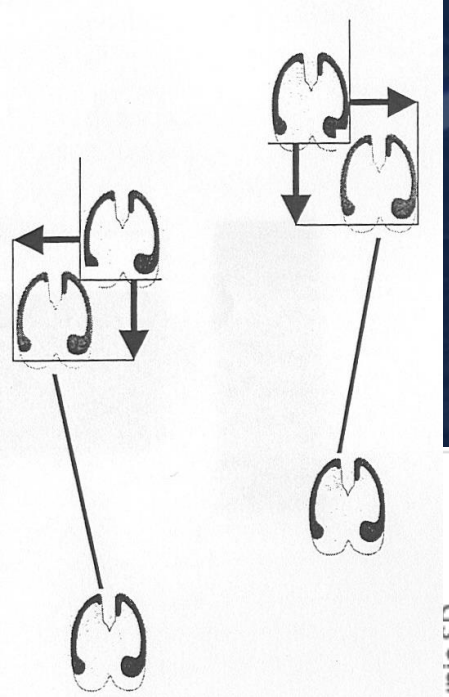
Rear leg rear view



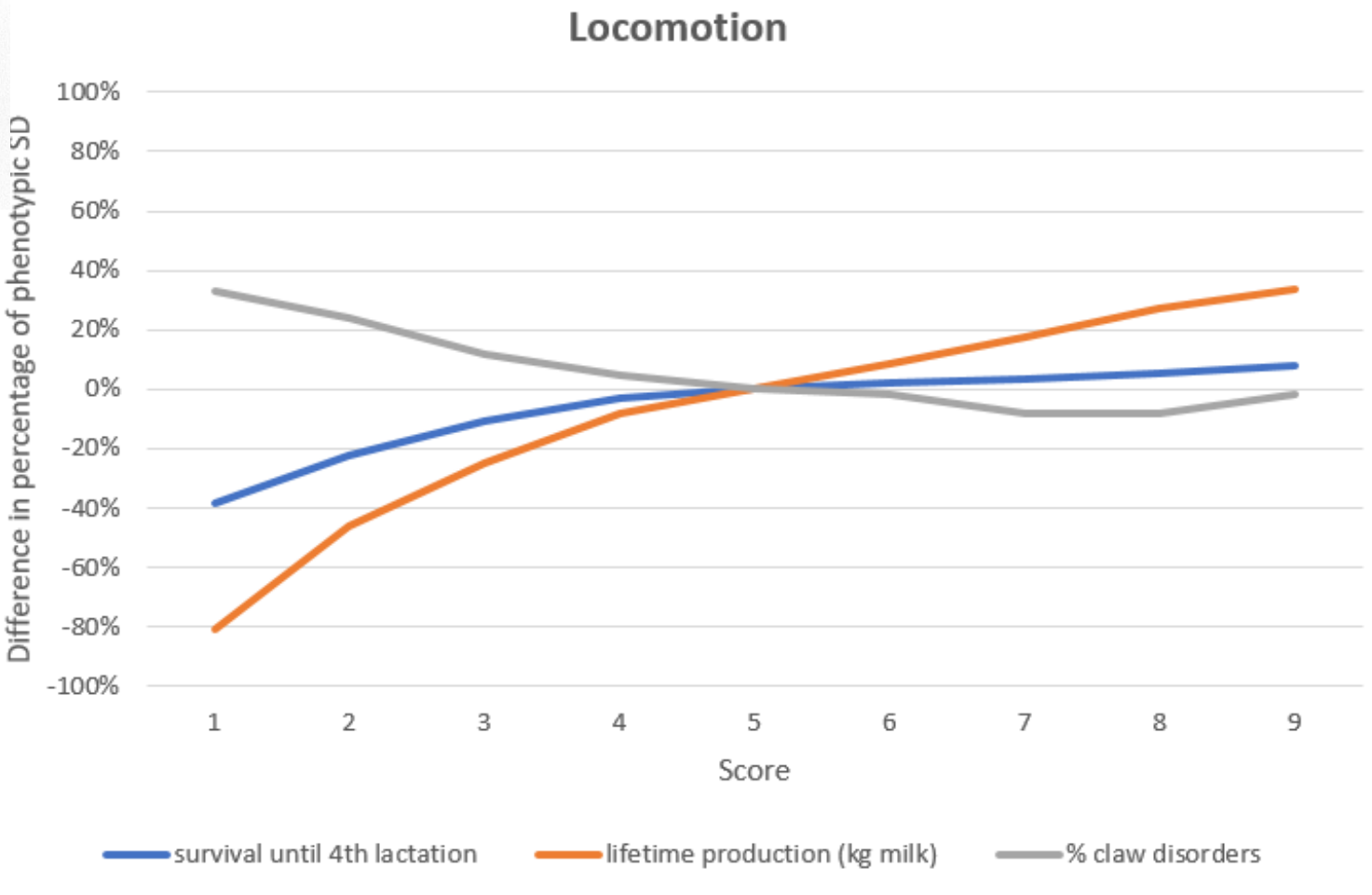
Rear legs set

Foot angle


Foot Angle
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
2
3
4
5
6
7
8
9
Score
survival until 4th lactation
lifetime production (kg milk)
% claw disorders



Locomotion


Locomotion
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
2
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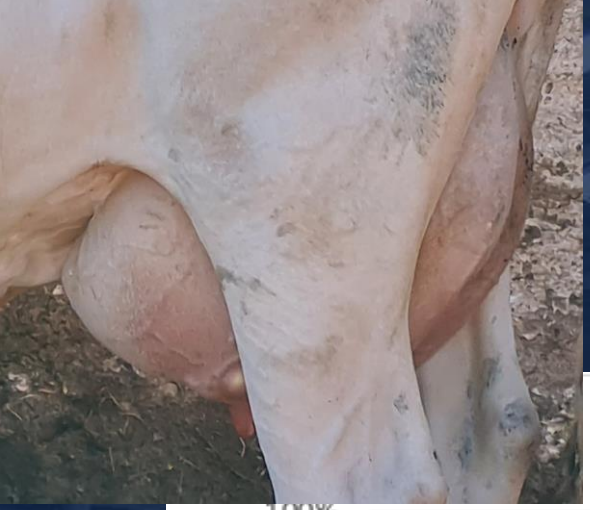
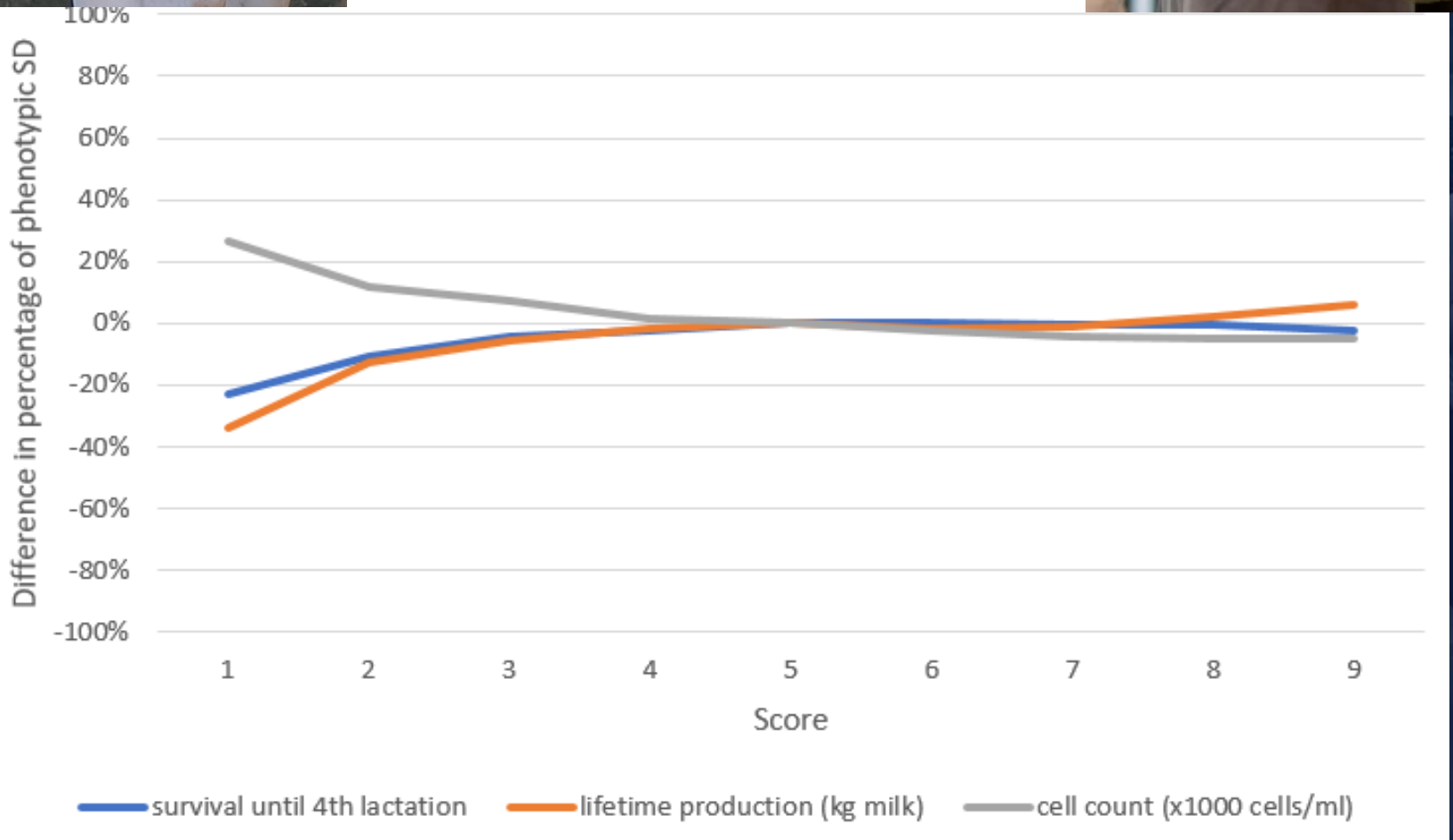
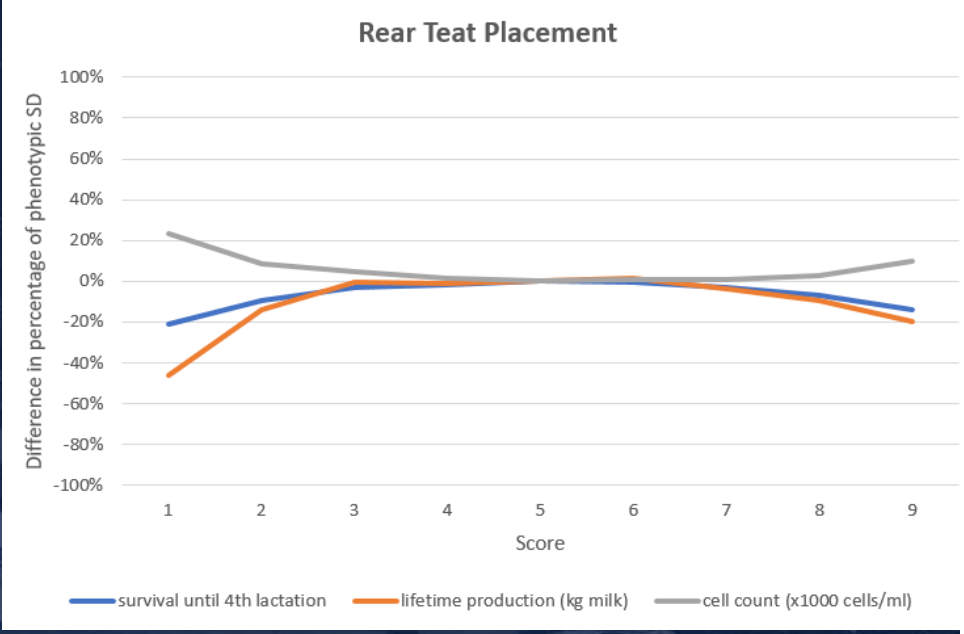
9
Score
survival until 4th lactation
lifetime production (kg milk)
% claw disorders



Fore udder attachment

Fore Udder Attachment




Rear Teat Placement
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
2
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4
5
6
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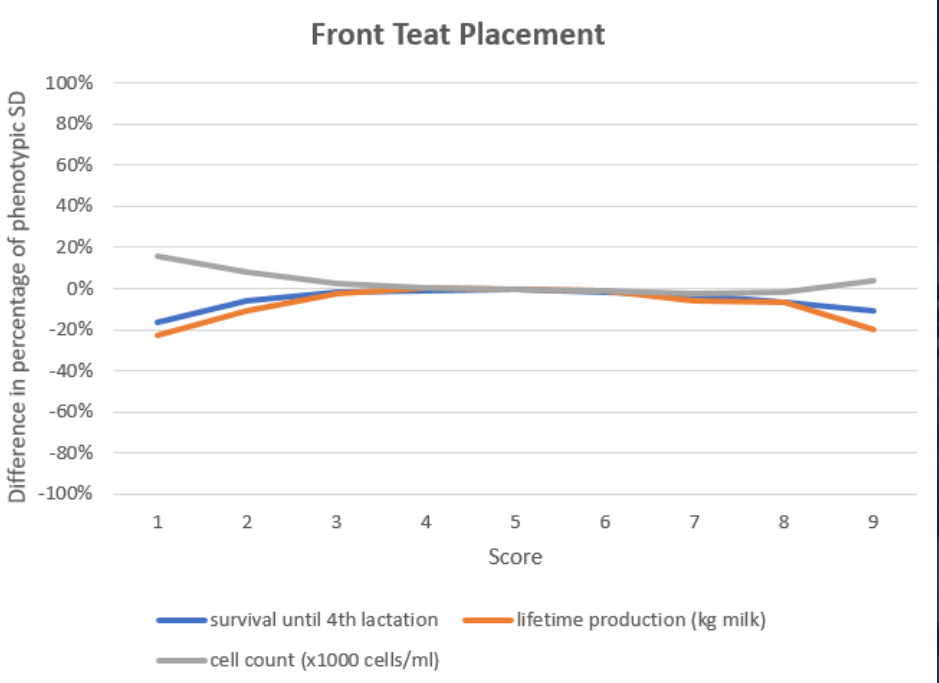
9
Score
survival until 4th lactation
lifetime production (kg milk)
cell count (x1000 cells/ml)


Front Teat Placement
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
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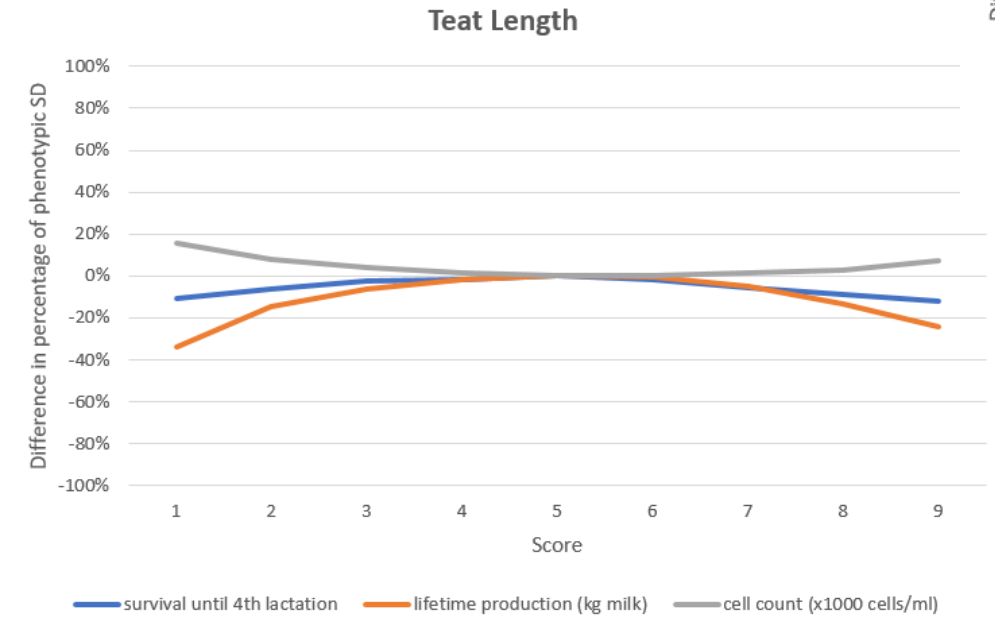
Score
survival until 4th lactation
lifetime production (kg milk)
cell count (x1000 cells/ml)


Teat Length
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
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Score
survival until 4th lactation
lifetime production (kg milk)
cell count (x1000 cells/ml)


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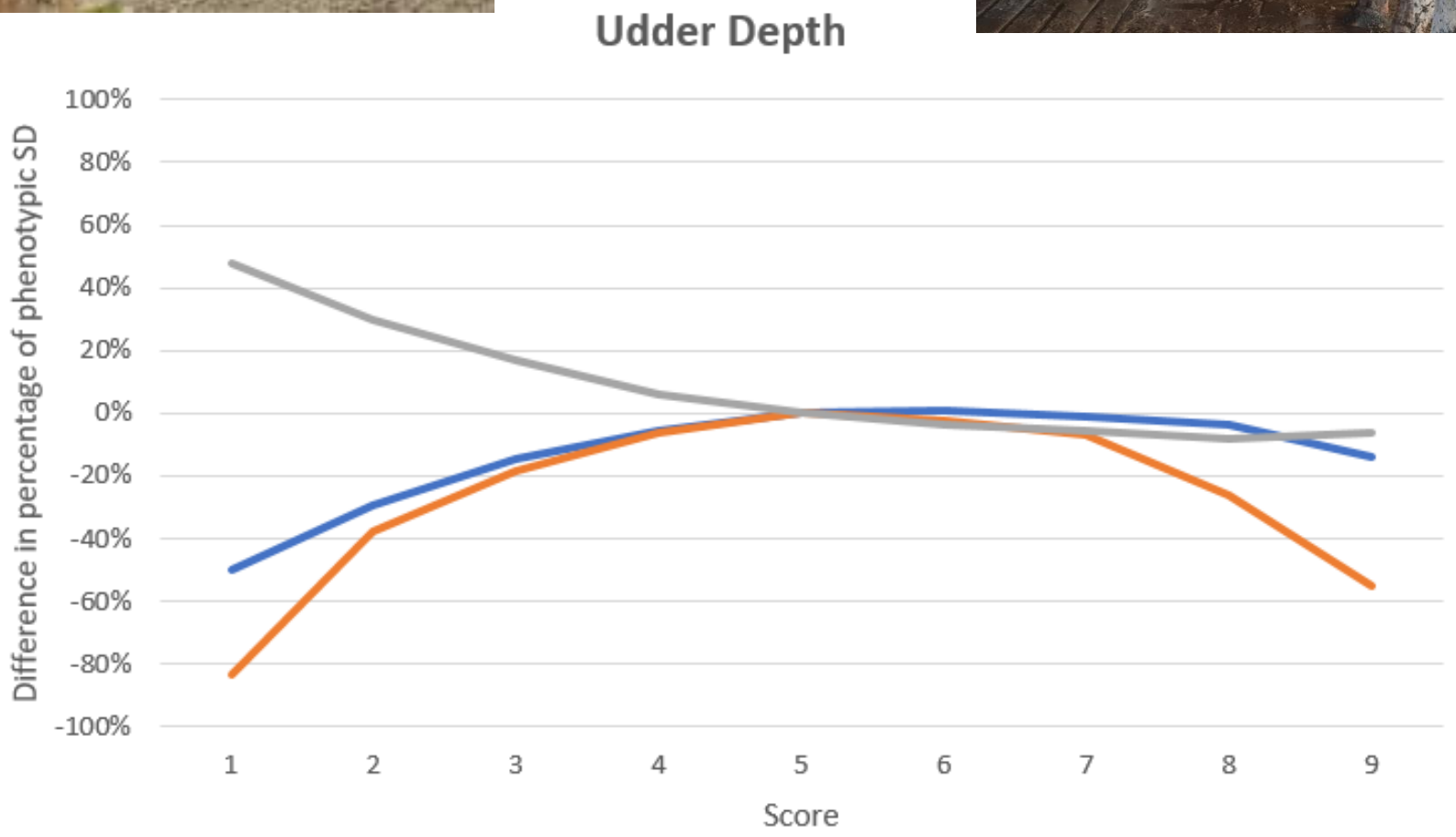
Udder Depth


Udder Depth
Difference in percentage of phenotypic SD
100%
80%
60%
40%
20%
0%
-20%
-40%
-60%
-80%
-100%
1
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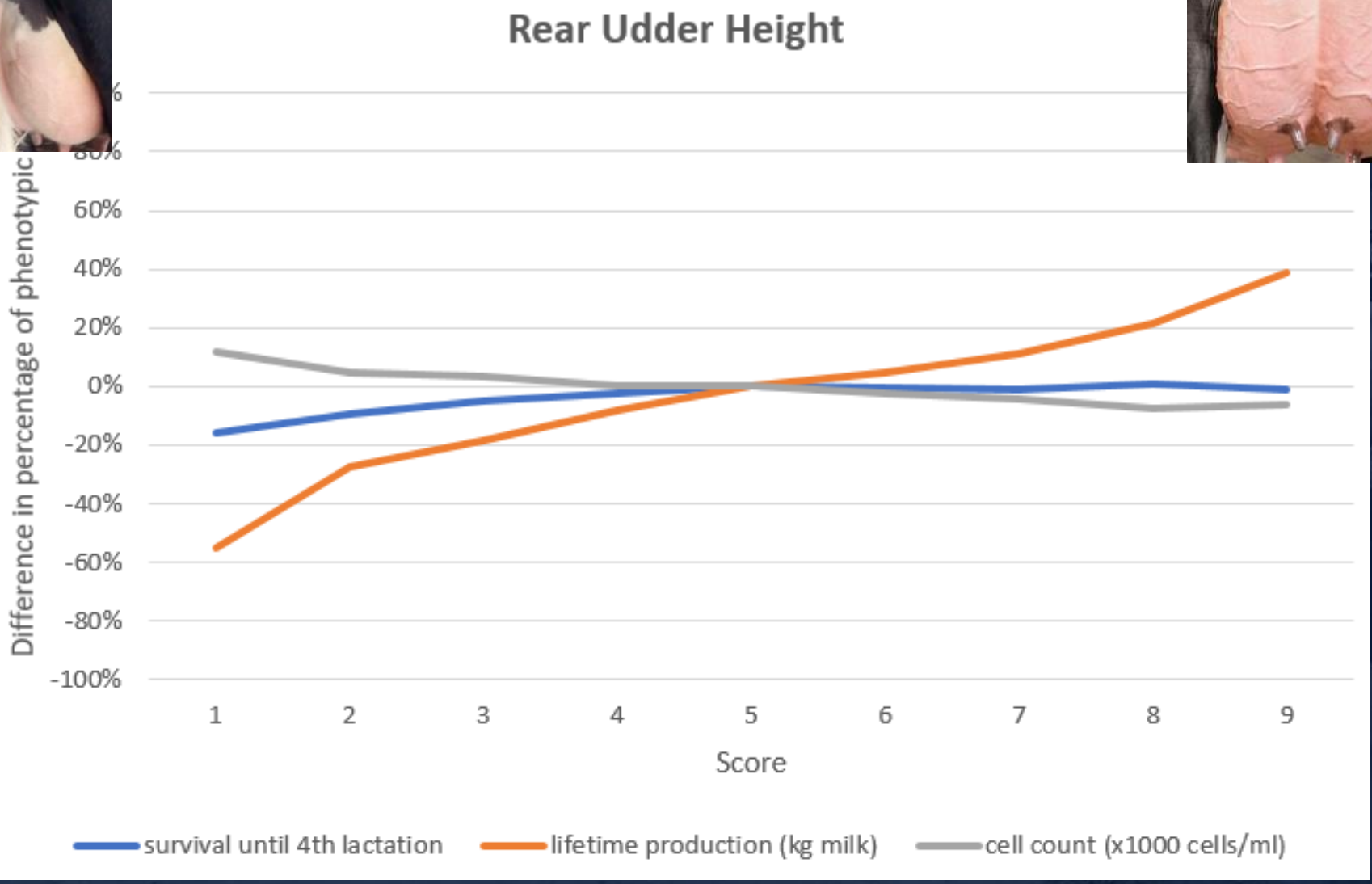
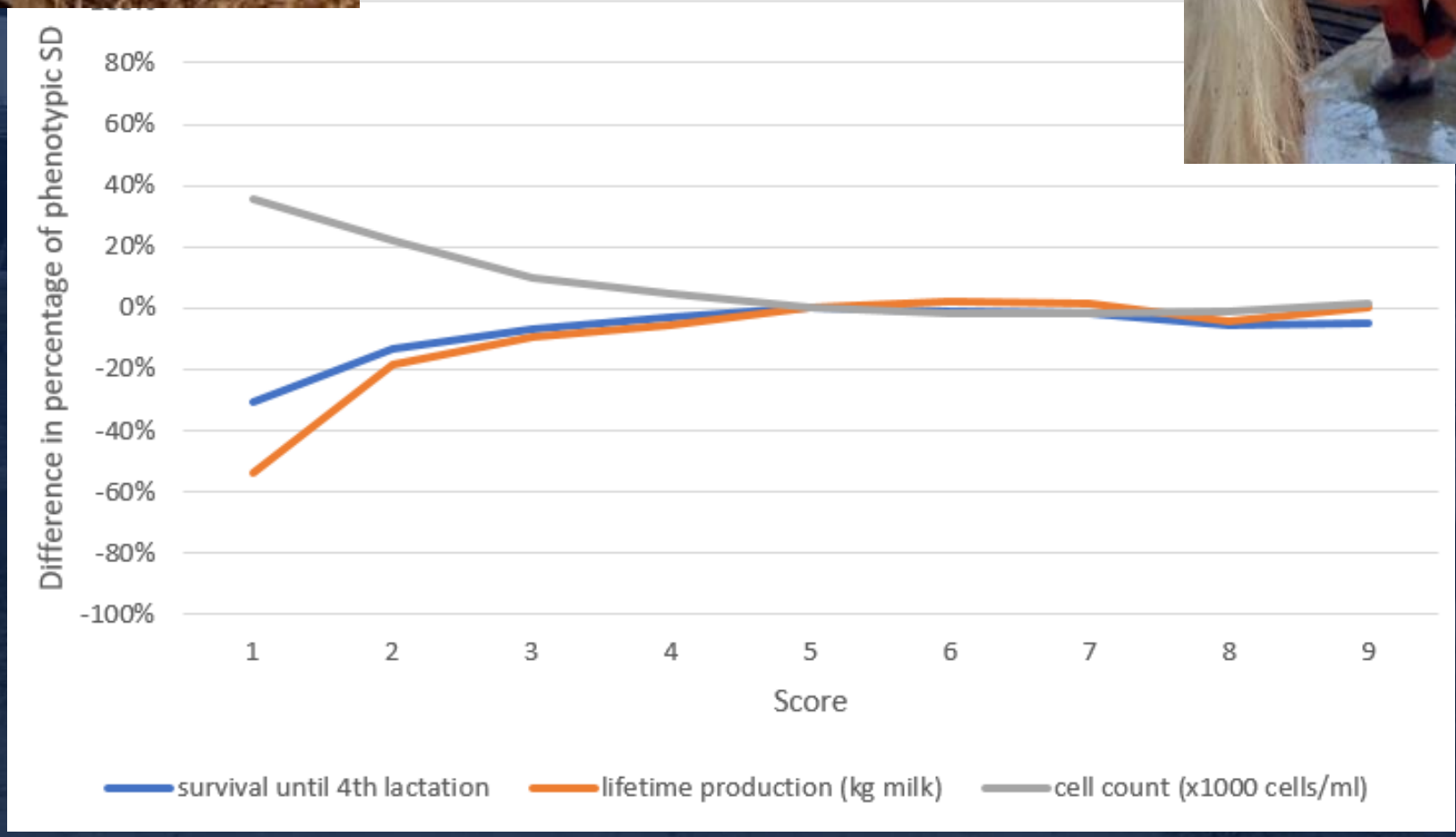
Score
survival until 4th lactation
lifetime production (kg milk)
cell count (x1000 cells/ml)

Rear Udder Height



Centrtal Ligament



Tha messge for the farmers:

Don’t need extreme type, just need a relaible functionality which provide
reliable, trouble-free and profitable production.

Tom Byers (Canada)

„Breed for milk and get the conformation to handle the milk”

You can find the details of the presentation on ICAR website on the following link:

www.icar.org/Guidelines/05-Conformation-recording-Appendix-5.pdf

Thank you for your kind attention!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