



WHFF 5505a Appendix II Six New Proposed traits for the WHFF conformation trait list

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Introduction

For the 2022 WHFF classifiers workshop a survey was carried out on the linear traits countries are using in their conformation classification system. Besides the 18 standard WHFF linear traits countries also score extra linear traits. To support the harmonization of linear traits, the working group wanted to collect information on the trait definition applied, heritability and correlations with other traits, like linear conformation traits and functional traits.

The WHFF type harmonization working group has indicated from the survey six traits which are commonly scored or countries will start to score coming period.

From the list of 22 extra traits organizations are scoring it was clear that some traits are quite commonly scored like rear udder width, bone quality, udder balance, loin strength and udder texture, scored by at least 30 percent of the countries. And during the workshop in Morges several countries indicated they would start to score front feet orientation.

The question for the working group, and also for WHFF, is always, which traits are candidate to be added to the WHFF linear trait list.

This memo consists of 3 parts:

1. proposal for trait definitions, based on the information of the survey among WHFF members for an extra trait list for harmonization
2. criteria to determine if a trait can be part of the official WHFF conformation trait list
3. proposal for traits for the official list.

1. Traits definitions

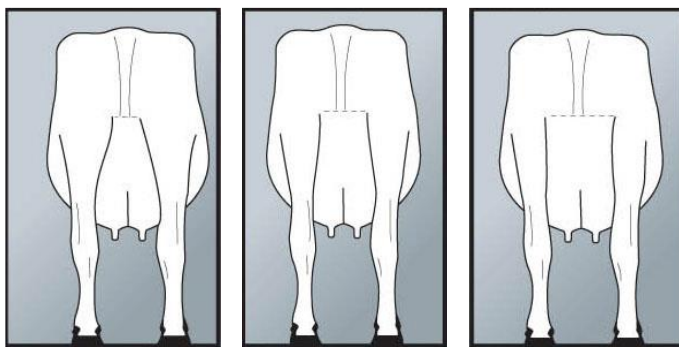
Rear udder width

Ref. Point: Width of the udder at the point where the milk secretion tissue is attached to the body.

1 - narrow

5 - intermediate

9 - wide



1

5

9

Narrow

Wide

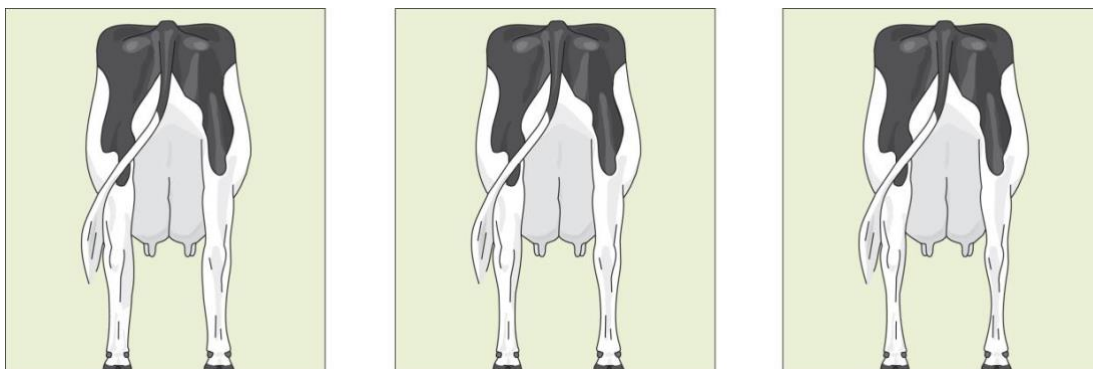
Bone quality

Ref. Point: Flatness of bone in the rear legs between the hock and pastern, viewed from the rear.

1 - coarse

5 - intermediate

9 - flat



1

5

9

Coarse

Flat

Udder balance

Ref. Point: Levelness of udder floor.

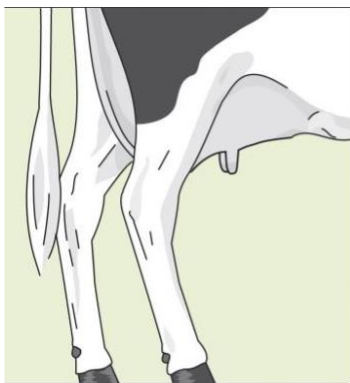
The trait is assessed from the side where the deepest point of the rear udder floor is compared to the deepest point of the front udder floor.

In case there is a difference between both sides, score the most natural side.

1 – rear deeper

5 – intermediate

9 – front deeper



1

Rear deeper



5



9

Front deeper

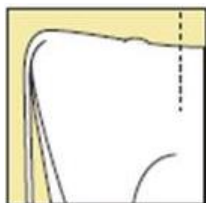
Loin strength

Ref. Point: Strength of the loin

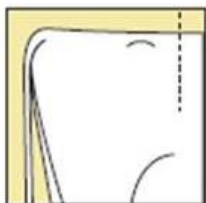
1 – weak

5 – intermediate

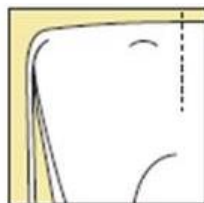
9 - strong



1 WEAK



5 INTERMEDIATE



9 STRONG

Udder texture

Ref. Point: Softness of the tissue of the udder.

- 1 – fleshy
- 5 – intermediate
- 9 – soft

It is not a linear trait.



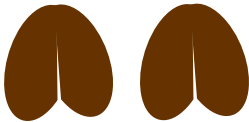
For an empty udder an udder which is milked away is considered to be soft, and an udder with a lot of tissue left (fleshy) is scored as fleshy.

For a full udder an udder with thin skin and visible veins are indicators for a soft udder.

Front feet orientation

Ref. Point: The orientation of the front feet, scored from behind the cow.

- 1 – toes extremely out
- 5 – intermediate
- 9 – toes parallel

1	5	9
Extreme toe-out	Average slightly outside oriented	Parallel. straight forward
		



2. Criteria for main list and list extra traits

We also need to describe the criteria for the new traits when they are candidate for the official WHFF conformation trait list and when we should consider them as extra trait, WHFF is just providing a trait description to facilitate harmonization.

Criteria for official WHFF conformation trait are:

1. Trait is a linear (one dimension) trait and has a clear trait definition
2. Trait has no genetic correlation above a certain level, like 0.85, with one of the official WHFF linear traits
3. Trait has a heritability of at least a certain level, like 10%.
4. Trait has added value for a functional trait like longevity, udder health, fertility, claw health. A genetic correlation with a functionality trait could be considered to be at least 20%
- 5a. About at least 50 percent of WHFF member countries are scoring the trait or have plans to start scoring and introduce a breeding value within 3 years
or
- 5b. Countries score a defect which is similar to the linear trait and the incidence is higher than 5 percent, and the defect is scored in many countries, like more than 50% of the countries.

Ad 1: only real linear traits should be added to the WHFF conformation trait list

Ad 2: only traits that add real new information can be added to the WHFF conformation trait list

Ad 3: the trait should be heritable and should have enough genetic variation. The heritability shows which part of the variation you see between animals is heritable

Ad 4: the trait should have reasonable value for any functional trait like longevity, udder health, claw health and/or fertility. In this way the conformation trait has added value for the farmer.

Ad 5. there should be enough interest among countries to score the new official WHFF linear trait.

Ad 6: for some defects at a certain moment the incidence can increase and the variation can increase so it can be scored on a scale of 1 to 9. A trait which first was a genetic defect can become a linear trait.



3. Application of criteria on the 6 extra traits

Based on the criteria mentioned in paragraph 2 a proposal is made in table below to determine which traits could be candidate to be part of the official WHFF conformation standard trait list and which should be on the extra trait list.

The non-official traits could be added to the WHFF document with their trait definition to stimulate further harmonization.

	Rear udder width	Bone quality	Udder balance	Loin strength	Udder structure	Front feet orientation
Linear trait	Y	Y	Y	Y	N	Y
Genetic correlation other linear traits less than 0.85	N	Y	Y	Y	Y	Y
Heritability at least 0.10	Y	Y	Y	Y	Y	Y
Genetic correlation functional trait at least 0.20	Y longevity	N	Y longevity	N	Y mastitis	Y claw health
More than 50% WHFF score the trait	Y	Y	Y	N	N	Y
Scored as defect with at least 5% incidence, and scored in > 50% countries	N	N	N	N	N	N
Candidate standard WHFF list	N	N	Y	N	N	Y
Candidate extra trait list	Y	Y	N	Y	Y	N

Conclusion from the above table is:

1. Two traits which could be added to the standard WHFF conformation trait list: udder balance and front feet orientation.
2. The list of extra, non official, WHFF traits consists of rear udder width, bone quality, loin strength and udder structure. These traits can be added to the WHFF documentation to stimulate further harmonization.