Dairy sheep udder measurements and assessments in the Czech Republic

M. Milerski[1], M. Cerná[1] and J. Schmidová[1]

[1]Institute of Animal Science, Prátelství 815, 10400 Prague 10, Uhríneves, Czech Republic
Corresponding Author: milerski.michal@vuzv.cz

Abstract

The introduction of machine milking to dairy sheep industry evokes the requirement to pay more attention on morphological and functional characteristics of udders. For this reason the methodology of udder measurements and assessment were proposed for dairy sheep breeding scheme in the Czech Republic. Udder depth (UD), udder width (UW) and teat length (TL) are measured by ruler. Teat placement (TP), udder cleft (UC), rear udder attachment (RA) and fore udder attachment (FA) are subjectively assessed by linear scoring using 5-points scale. In 2018 the udder assessment methodology was implemented in recorded Lacaune population in the Czech Republic. According to preliminary results the correlation between udder width and breeding values for milk production during milking period was r=0.443. Genetic evaluation based on measured and subjectively assessed udder traits could become an effective tool in selection programs aimed at improvement of udder morphology in dairy ewes in the future.

Keywords: sheep, dairy, udder morphology, linear score.

Introduction

Functional and well-formed udder of ewe is a prerequisite for good lamb rearing and milk production. The udder shape is related to its suitability for machine milking, milk production and composition, resistance to mastitis, milking ability or lamb's ability to find and grab the teat. The ideal udder from the point of view of machine milking should be symmetrical semi-hemispherical in shape with a rigid ligament and mid-sized teats at the bottom. One of the characteristics of udder morphology is the size of the milk cisterns (*Sinus lactiferus* pars *glandularis*), since cisternal milk is achievable for release before oxytocin reflex is started. Animals with high volume of cisterns are generally better milk producers and can tolerate longer milking intervals. Specialized dairy cattle store less than 30% of the total milk yield in cisternal area, whilst in sheep, the share of cisternal milk ranges from 25-75% and in dairy breeds generally exceeds 50%. From the point of view of use the morphological characteristics of the udders in the breeding programmes, the knowledge of their heritability is important. Legarra and Ugarte (2005) found moderate coefficients of heritability for teat position $h^2 = 0.24$ in the Churra and $h^2 = 0.38$ -0.42 in the Latxa breed. Monitoring of the shape of the udders in dairy sheep is important because of the unfavourable genetic correlations between milk production and some of the shape characteristics of the udders, especially the teats position. One-sided selection for milk production can then be associated

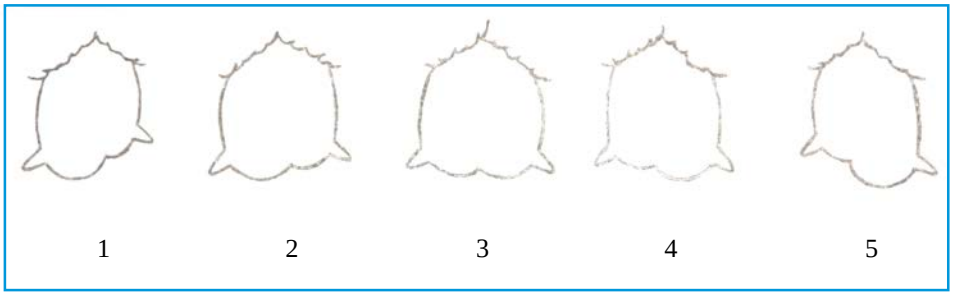
with deterioration of the udder shape (MaCuhová et al., 2008). Methodology of udder measurements and assessment were proposed on the basis of previous works (Makovický et al., 2015; Margetín et al., 2011, 2013; Milerski et al. 2006).

Methods – system of measurements and linear scoring of sheep udders in the Czech Republic

The measurements and linear scoring of udders are performed before milking (about 12 hours after the previous milking) and between 20 and 100 days of lactation. It is advisable to perform a linear description of udders on 2nd or 3rd control day of performance recording scheme.

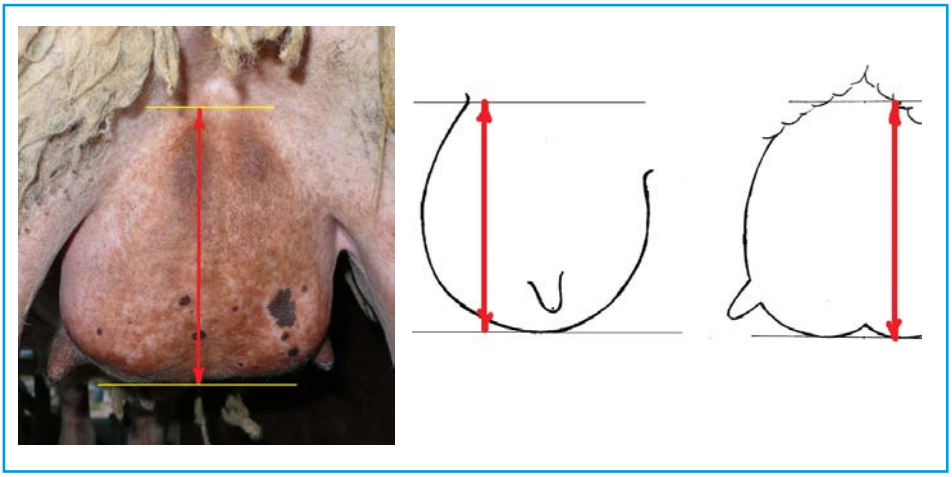
Udder symmetry

Udder symmetry is evaluated subjectively as the first of udder shape characteristics. The symmetrical udder is marked with the number 3. The udder with a significantly larger (more than three times the estimated volume) left half is marked with the number 1 and udder with a much larger right half with the number 5.



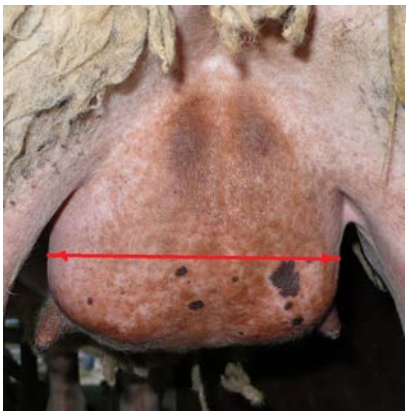
Udder depth

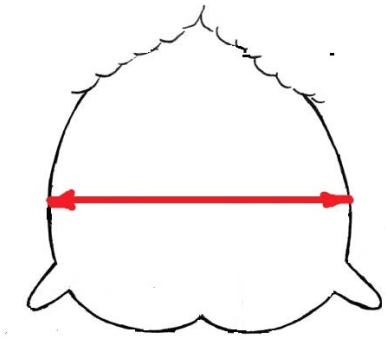
The udder depth is measured from behind from the top of the mammary gland to the lowest point of udder (not the teats).



Udder width

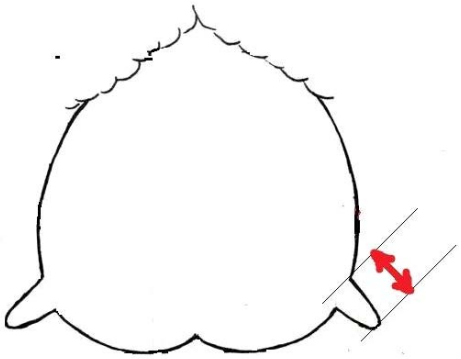
The udder width is measured from behind with the full cm accuracy at the widest part of udder. Teats are not taken into account.





Teat length

The length of the longer teat is measured from its base to the tip with 0.5 cm accuracy. If the length of both teats is visually the same, the right teat is measured.



Teats position

It is judged from the back. The location of the teats on the udder and the largely associated characteristics, such as the teats angle or the proportion of the udder below the teat level, are evaluated.

1 – nearly vertically situated teats

2 - teats slightly facing to the side, placed at the bottom of the udder

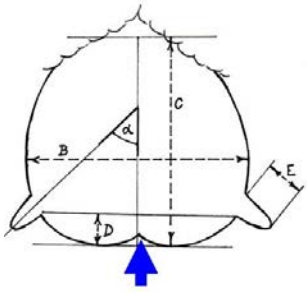
3 – teats angle cca 45?

4 -teats situated on the sides of the udder, more horizontal position

5 –horizontal teats, situated high on sides of the udder

Udder cleft

It is judged from the back. Evaluated is the degree of split udder to two halves given the depth of the medial furrow as an indicator of the strength of the udder's central suspension ligament.



1 – very distinct central suspension ligament, expressly split udder

2 – distinct central suspension ligament

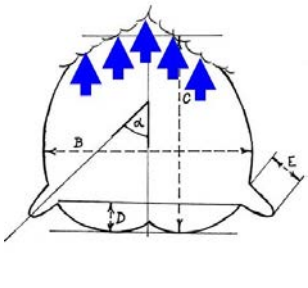
3 – less pronounced but noticeable udder cleft

4 – imperceptible cleft

5 – very weak and relaxed central suspension ligament

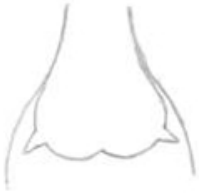
Rear udder attachment

It is judged from the back. The width of the rear udder attachment and the degree to which the udder fills the space between the hind legs are evaluated.

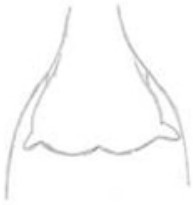


1 - very wide udder clamping, space between legs completely filled

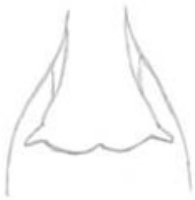
2 - wide udder clamp, space between legs almost filled



3 - medium clamping, enough space for udder



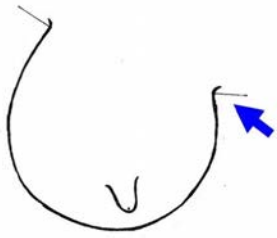
4 - weaker clamping, dropping udder

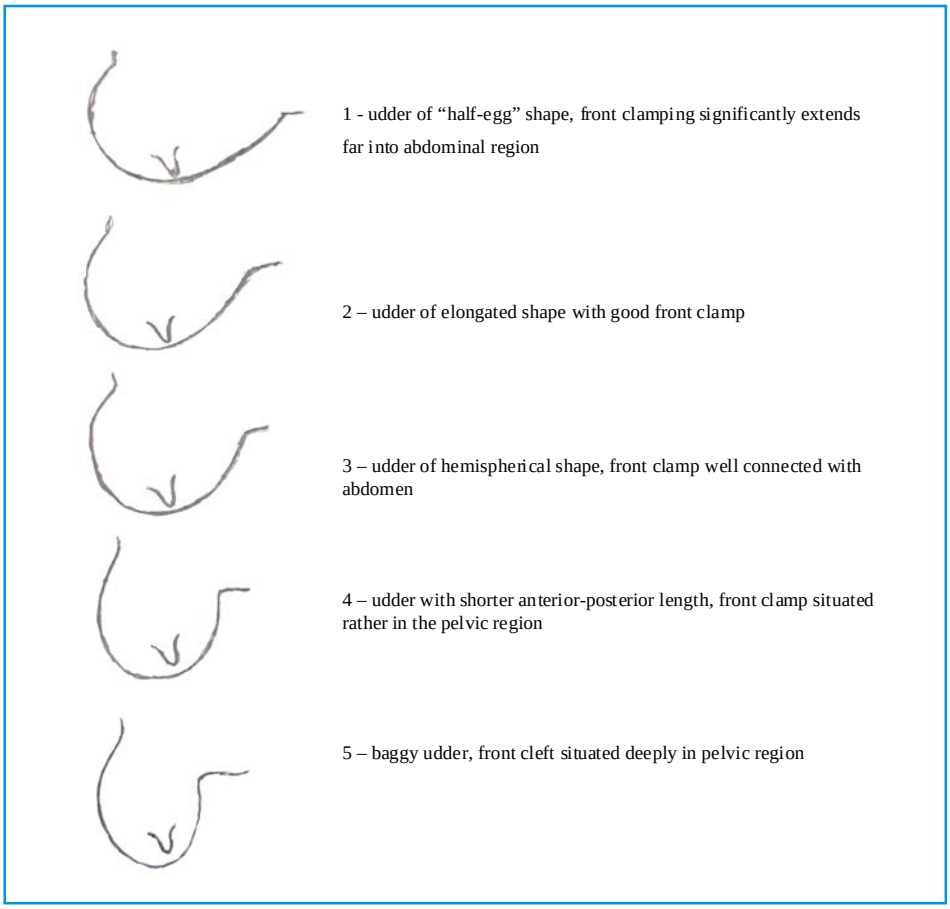


5 - very weak clamp, baggy udder, distinctive skin folds on the sides of udder

Front udder attachment

It is judged best when viewed from the side or from below using palpation. The anterior-posterior udder length and its attachment to the abdominal area of the ewe body are evaluated.





Preliminary results

In 2018 the udder assessment methodology was implemented in recorded Lacaune population in the Czech Republic. Totally 329 ewes were assessed. Averages and standard deviations for udder measurements and assessment are shown in Table 1.

According to preliminary results the correlation between udder width and breeding values for milk production during milking period was r=0.443.

Table 1. Averages and standard deviations for udder measurements and assessment.

Trait	Unit	Mean	Std. dev.
Udder symmetry	points	3.10	0.32
Udder depth	cm	18.76	2.55
Udder width	cm	18.17	1.54
Teat length	cm	2.57	0.64
Teats position	points	2.76	0.54
Udder cleft	points	2.66	0.67
Rear udder attachment	points	2.64	0.64
Front udder attachment	points	2.81	0.43

Conclusion

Genetic evaluation based on measured and subjectively assessed udder traits could become an effective tool in selection programs aimed at improvement of udder morphology in dairy ewes in the future.

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