Factors affecting growth of suckling Angus calves

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Introduction

Suckled calf production has become an important way of managing marginal grassland. The proportion of suckler cows in the total cow population was 13.6 % in Germany (BRS, 2018). Suckler cows are kept in different regions of Germany with a wide range of environmental conditions. Hence, different management systems were employed with the common aims of calving ease and high growth performance of calves.

Breeding for higher birth weights can lead to a higher daily gain (Arnold et al., 1990) but can cause calving difficulties. Therefore, traits have to be found which allow to combine calving ease and good growth rate in different faming systems. Goonewardene et al. (2003) scored the udder with different types and found a relationship to milking ability of the cow. Sapp et al. (2004) showed that cows with small teats or tight udders produced less milk.

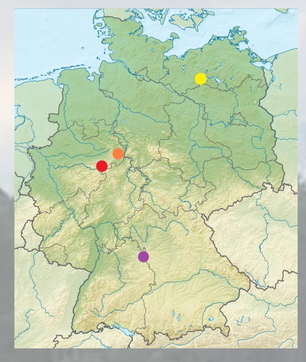
The objective of the present study was to evaluate suckling performance of Angus calves in different regions and in relation to traits of their mother.

Materials and methods

From April 2015 to March 2017 data of 600 single born calves in four herds were collected in northeast lowlands (herd 1) and in low mountain ranges of Germany. Udder volume and teat circumference were derived from 316 German and Aberdeen Angus cows. Both traits were classified with 3 categories (1 = small) according to volume and circumference, respectively.

The following statistical models with fixed effects were employed with the procedure GLM in SAS 9.3 (SAS Institute Inc., 2012):

- model 1 with the effects herd (1-4), calving season (1: October to March, 2: April to September) and parity (1, 2-5, >5),
- model 2 and 3 with herd, calving season, parity, birth weight (kg, <32, 32-38, >38) and additionally udder volume (1-3, mod. 2) and teat circumference (1-3, mod. 3), respectively.



Results and discussion

The mean weights at birth and on day 200 were 36.2 kg (± 4.1 kg) and 232.0 kg (± 33.5 kg), respectively. Average daily gain from birth to the 200th day of life was 1139.4 g (± 164.0 g).

Table 1: LS-Means (standard error as index) of weight at birth, weight on day 200 and daily gain for herds, seasons and parities with p-values (model 1)

Effect	N	Weight (kg)		Daily gain (g/d)
		at birth	on day 200	
Herd	600	P<.05	P<.05	P<.05
1 (lowland)	341	**34.2** $_{\mathbf{0.23}}$	223.0 $_{2.04}$	1088 $_{9.82}$
2	144	38.9 $_{0.34}$	236.5 $_{3.01}$	1173 $_{14.48}$
3	75	37.7 $_{0.43}$	234.4 $_{3.83}$	1170 $_{18.42}$
4	40	37.1 $_{0.58}$	243.5 $_{5.15}$	1217 $_{24.78}$
Season	600	P<.05	P<.05	P>.05
1 (cold)	319	37.3 $_{0.30}$	238.9 $_{2.67}$	1171 $_{12.82}$
2	281	**36.6** $_{\mathbf{0.26}}$	229.8 $_{2.27}$	1153 $_{10.93}$
Parity	600	P<.05	P<.05	P<.05
1 (first)	117	**35.5** $_{\mathbf{0.36}}$	222.3 $_{3.23}$	1102 $_{15.55}$
2	332	37.5 $_{0.24}$	241.0 $_{2.16}$	1188 $_{10.38}$
3	151	37.9 $_{0.33}$	239.8 $_{2.90}$	1196 $_{13.94}$

Calves of the lowland herd and the warmer calving season showed the lower birth weights. First parity cows gave birth to the lightest calves.

Table 2: LS-Means (standard error as index) of weight on day 200 and daily gain for birth weight, udder volume and teat circumference with p-values (model 2 and 3)

Effect	N	Weight on day 200 (kg)	Daily gain (g/d)
Birth weight (model 2)	316	P>.05	P<.05
1 (light)	44	212.0 $_{5.75}$	1031 $_{25.89}$
2	194	222.1 $_{3.51}$	1097 $_{15.79}$
3	78	**227.0** $_{\mathbf{4.09}}$	**1121** $_{\mathbf{18.41}}$
Udder volume (model 2)	316	P>.05	P<.05
1 (small)	101	218.4 $_{4.21}$	1062 $_{18.97}$
2	165	**225.3** $_{\mathbf{3.61}}$	**1108** $_{\mathbf{16.28}}$
3	50	216.9 $_{5.28}$	1079 $_{23.79}$
Teat circumference (model 3)	316	P>.05	P>.05
1(small)	110	216.9 $_{4.19}$	1059 $_{18.86}$
2	150	224.0 $_{3.64}$	1100 $_{16.39}$
3	56	223.3 $_{5.08}$	1108 $_{22.87}$

Heavier birth weights led to increased daily gains and to higher weights on day 200. Udder volume had a significant influence on daily gains and medium-sized udders led to the highest daily gain and weight on day 200. Higher teat circumferences led to higher daily gains and weaning weights but results were not significant.

Conclusions

According to the present results, breeding for a medium-sized udder could influence growth of calves positive without any obvious disadvantage as opposed to breeding for higher birth weights. Herd management has to be adapted to region, calving season and parity of cows which influenced growth of calves.

Literature

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Analysing and optimising the relationships between greenlands, animal health and animal breeding in suckler cows (MuKuGreen)

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