



MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG



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Vigour and performance of German Angus cattle with different Myostatin-Genotypes

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Aim of the present study

Realize possible influences of:

- ⌚ increased amount of higher birth weights
- ⌚ higher frequency of dystocia
- ⌚ deficiency of the vitality

of German Angus calves



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Structure

- ④ Literature
- ④ Materials and Methods
- ④ Discussion of the Results
- ④ Conclusion



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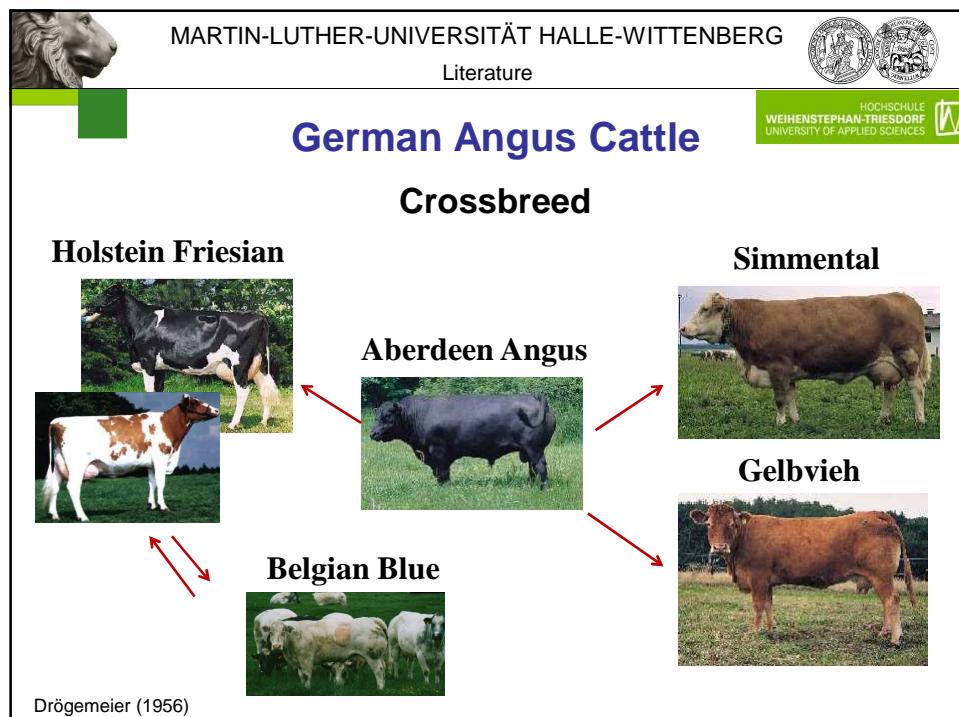
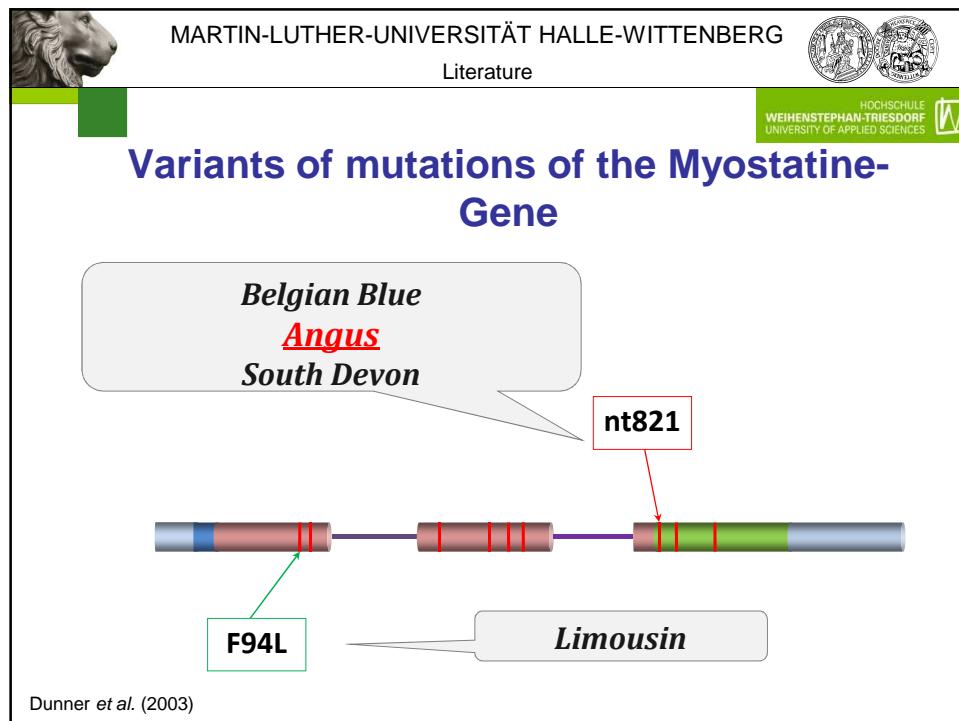
Literature



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Myostatine-Gene

- ④ Charlier *et al.* (1995):
Myostatine-Gene on bovine chromosome two
- ④ Grobet *et al.* (2000):
autosomal recessive inheritance
- ④ Hanset (1987):
Three Genotypes:
 - ④ homozygous free
 - ④ heterozygous
 - ④ homozygous double muscling



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 Materials and Methods



Data Collection



Data collection

- ⌚ September 2009 until March 2010
- ⌚ 31 herd book breeders from all federal states of Germany

Animals

- ⌚ 952 German Angus herd book cows
- ⌚ 732 German Angus herd book calves

Genotyping of the Myostatine-Gene

- ⌚ SNP – Genotyping (Eurofins Medigenomix GmbH®)



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 Materials and Methods



Statistical model



$$Y_{ijklm} = \mu + D_i + L_j + R_k + S_m + B_l(R_k) + e_{ijklm}$$

Y = observation

μ = sample mean

D = fixed effect (double muscling gene)

L = fixed effect (number of lactation)

R = fixed effect (region)

S = fixed effect (sex)

B (R) = fixed effect (farm within the region)

e = residual random error



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Discussion of the results

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Frequency (%) of the three Myostatine – Genotypes (nt821)

n	Double Muscling Genotype*			
	MH+/MH+	MH+/mh-	mh-/mh-	
Cows	936	78.50%	21.40%	0.10%
Bulls	106	85.80%	14.20%	-

MH+/MH+ = homozygous free genotype; MH+/mh- = heterozygous genotype;
mh-/mh- = homozygous double musling genotype

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Discussion of the results

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LSQ-Average (SE as Index) of traits from German Angus Cows

Traits	Myostatine-Genotype			
	n	homozygous free	n	heterozygous
Cow weight [kg]	509	625.3 3.7^a	127	646.8 6.2^b
Distance between ischial tuberosities [cm]	747	28.3 0.1^a	205	28.6 0.1^b
Breeding value for meat	564	99.9 0.5^a	154	102.6 0.7^b

a,b significant differences ($p \leq 0.05$)

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Discussion of the results

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LSQ-Average (SE as Index) of traits from German Angus Calves

Traits of calves	Myostatin-Genotype of cows		n	heterozygous ²
	n	homozygous free ¹		
Birth weight [kg]	571	36.9 0.27^a	161	38.6 0.44^b
Body length [cm]	476	54.3 0.21^a	145	55.2 0.32^b

¹⁾Homozygous free cows x homozygous free bulls : 100 % homozygous free calves
²⁾Heterozygous cows x homozygous bulls: 50 % homozygous free, 50 % heterozygous calves
a,b significant differences ($p \leq 0,05$)

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Discussion of the results

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Myostatine-Gen in German Angus Cattle, nt821(del11)




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Conclusion

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- ④ About 20 % of the German Angus herdbook cows carry the heterozygous myostatine-genotype
- ④ Which causes an increase of:
 - ④ cow weight
 - ④ distance between ischial tuberosities
 - ④ breeding value for meat
- ④ Heterozygous Genotype of the cow causes:
 - ④ heavier calves
 - ④ dystocia
 - ④ increased body length of calves

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Besamungsverein Neustadt a.d. Aisch e.V.

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Interessengemeinschaft Angus

ZDF
Ihr Partner für Rindfleisch

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Thank You