

The Effects of Polymorphisms in *Cadherin* on Sweat Gland Area in Brangus Heifers

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Introduction

- Heat stress limits beef cattle production
- Cattle disperse heat through sweating
- Larger sweat gland area allows cattle to sweat more effectively
- The *Cadherin* gene has been associated with sweat gland development

Methods

Skin biopsies were collected from neck of 470 Brangus heifers

- Biopsies were processed into histology slides (Figure 1).

Histology slides were photographed and sweat gland area (SGA) was measured using ImageJ software

- Genotypes were extracted from the Bovine GGP F250 array

The effect of 6 polymorphisms on SGA was evaluated using PROC GLM in SAS

- Collection group was fitted as a fixed effect

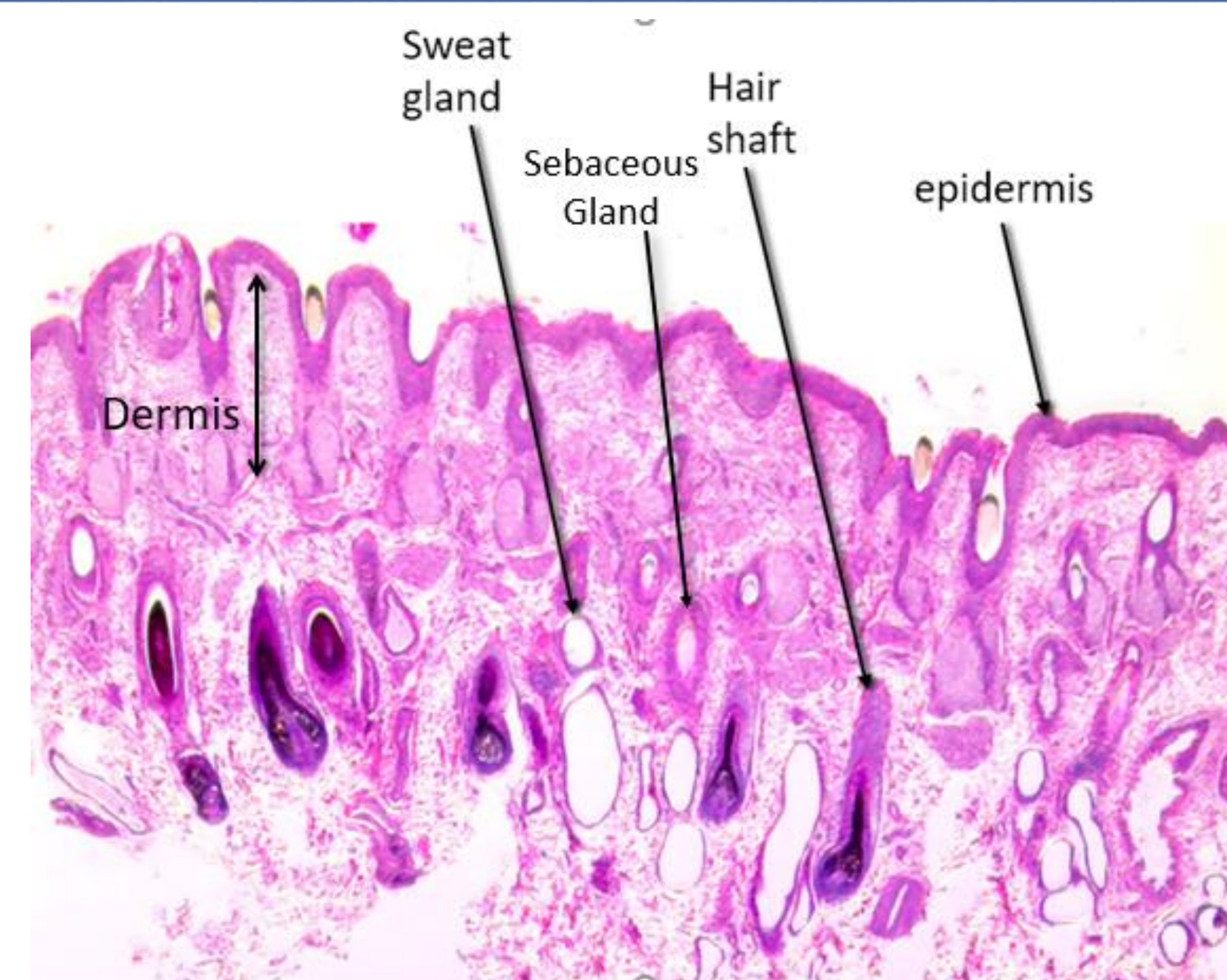


Figure 1. Labelled skin histology slide

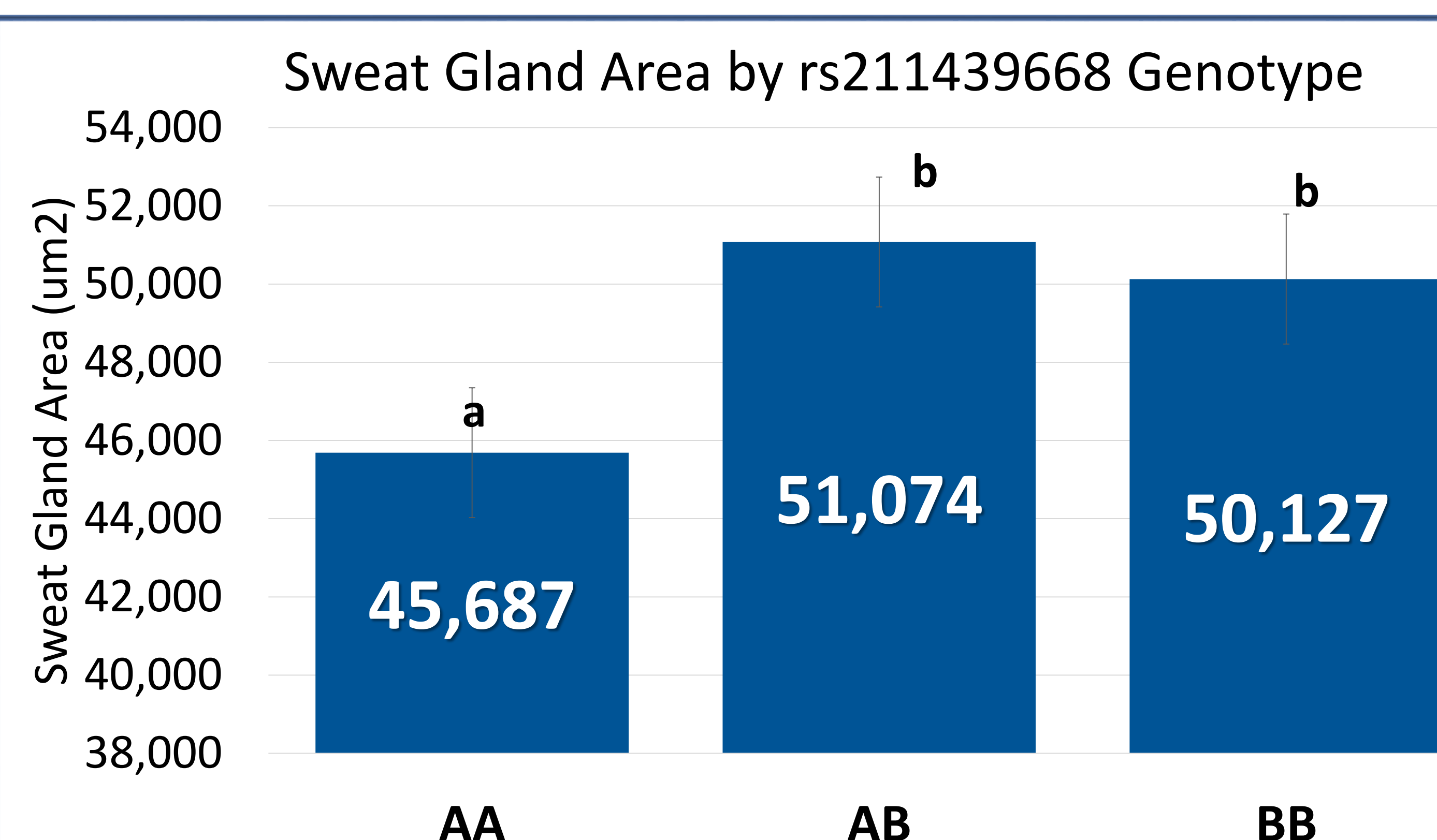


Figure 2. Bar graph of sweat gland area by genotype. Means without common letter differ

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Objective

- Investigate the effect of *Cadherin* polymorphisms on sweat gland area

Results

- One SNP (single nucleotide polymorphism) was found to have a significant effect ($P < 0.05$)
- This SNP (rs211439668) is a known splice variant
- rs211439668 had a dominant effect
- Animals that had at least one copy of the B allele ($n = 352$) had significantly larger sweat gland area than animals that were homozygous for the A allele ($n = 102$) (Figure 2)

Conclusions

- Animals that carry the B allele may have larger sweat glands and be more thermotolerant