

Does high-starch diet early in life result in long-term changes in selected gene expression in ruminal epithelium of sheep?

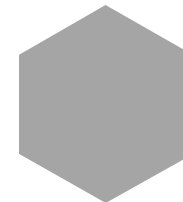
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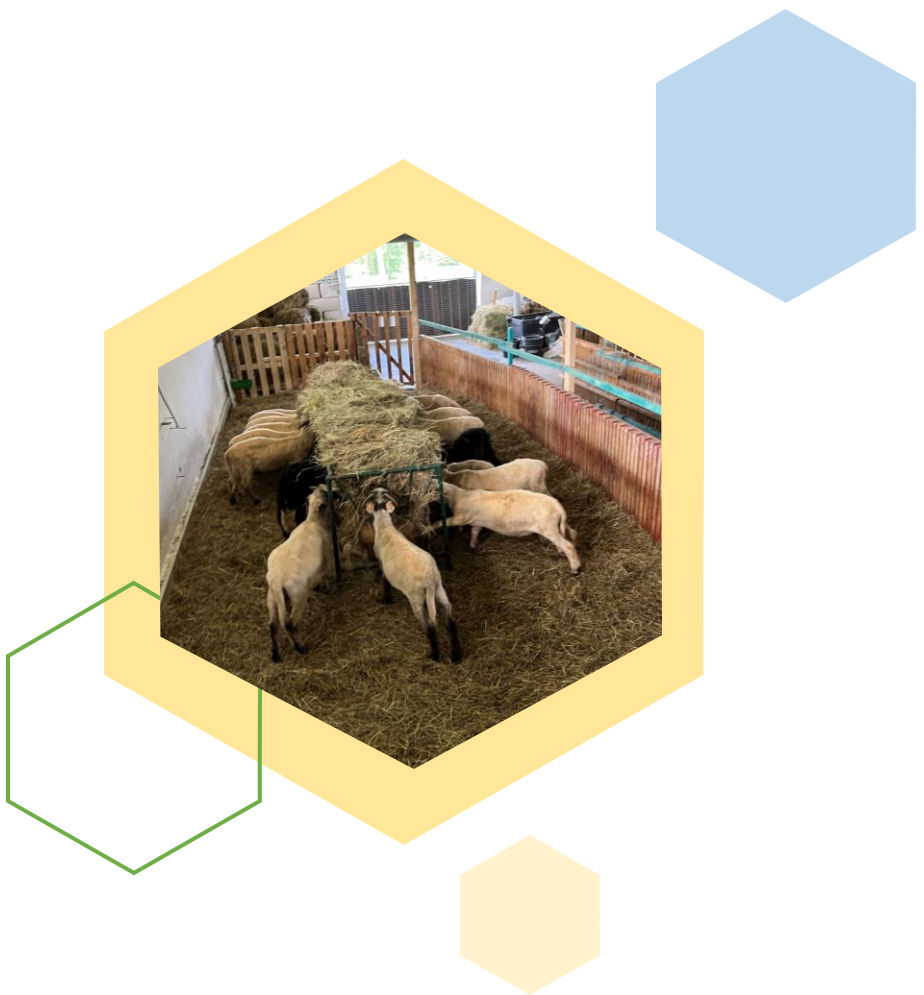
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Main question

Does high-starch diet early in life result in long-term changes in selected gene expression in ruminal epithelium of sheep?





Overview

- ✓ High-starch diet
- ✓ Key genes
- ✓ Research methodology
- ✓ Results
- ✓ Key findings
- ✓ Summary

High-starch diet

1. High-starch diet:

- ✓ Energy boost & feed efficiency
- ✗ Rumen challenges (SCFA/low rumen pH)

2. Early life high-starch exposure:

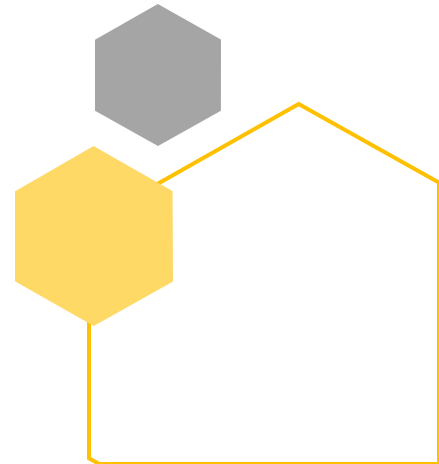
- 🐮 Accelerates rumen development
- ⚠️ May reduce metabolic flexibility

3. Metabolic programming:

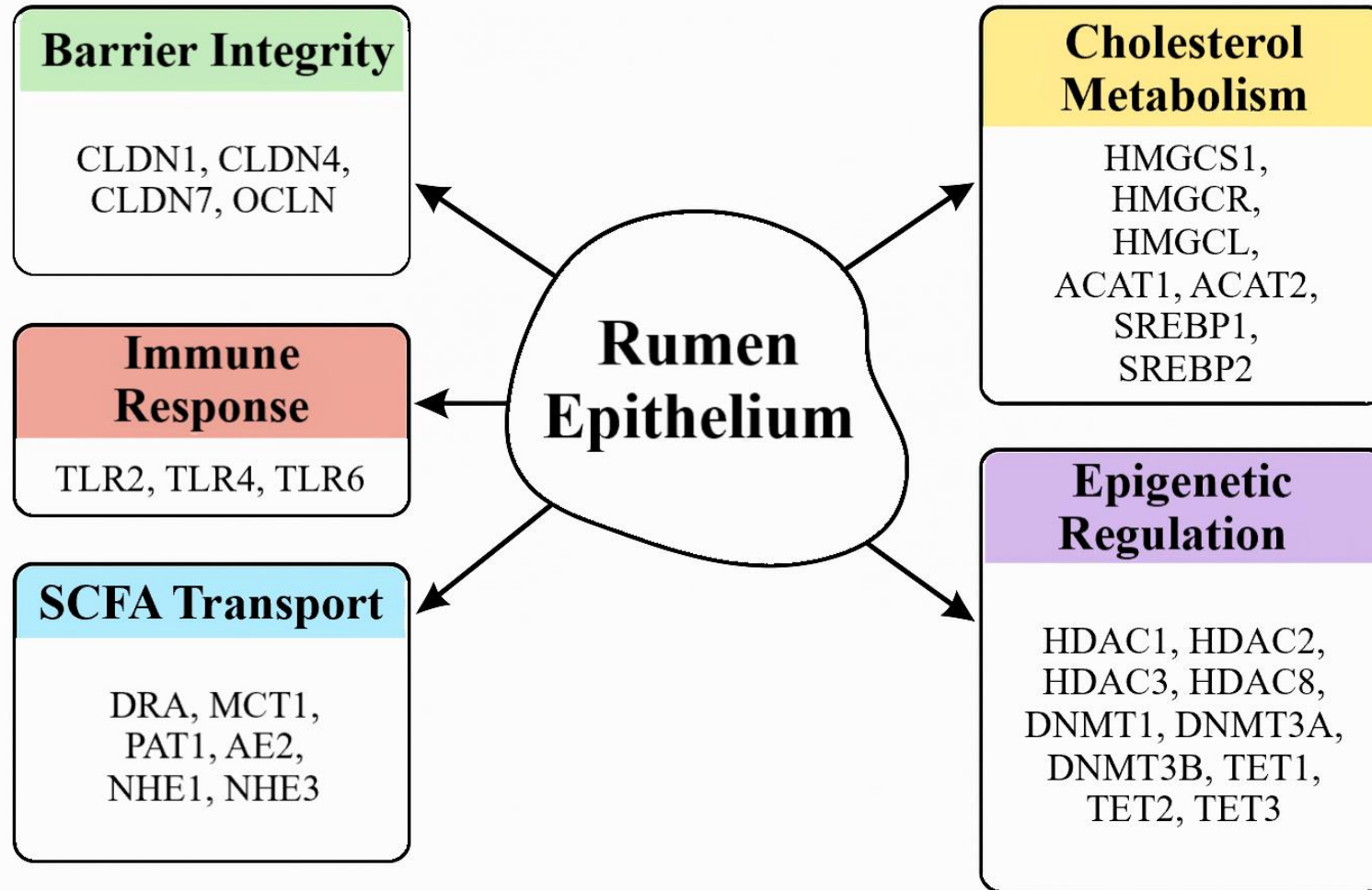
- 🧬 Diet early in life = lifelong metabolic "settings"

4. Hypothesis:

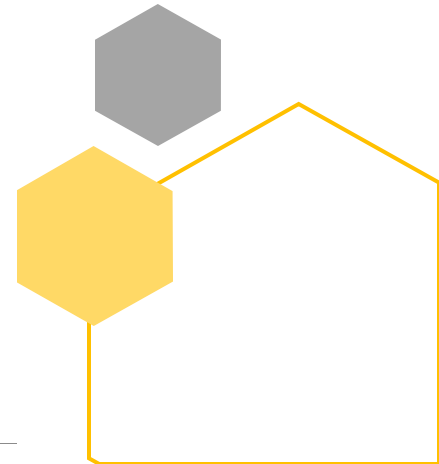
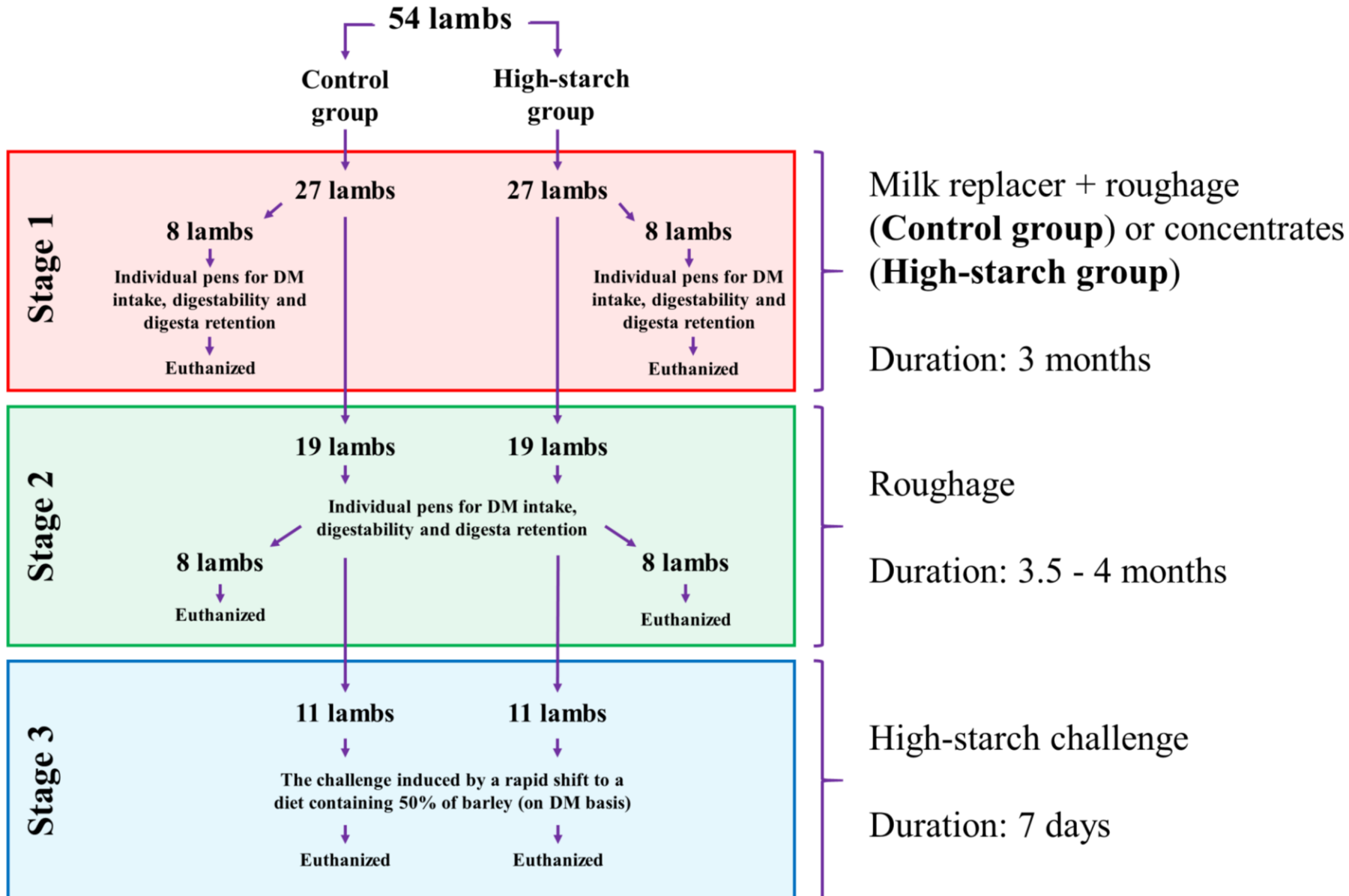
- 🔄 Early high starch intake → lasting changes in rumen function



Key genes

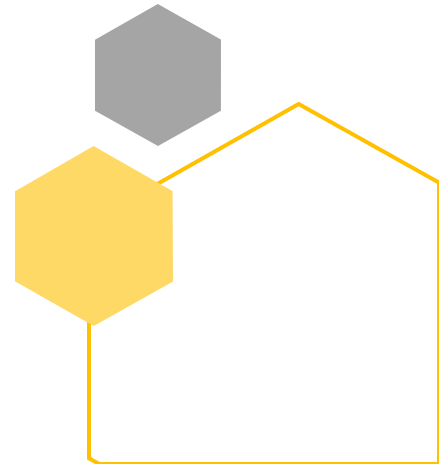


Research methodology

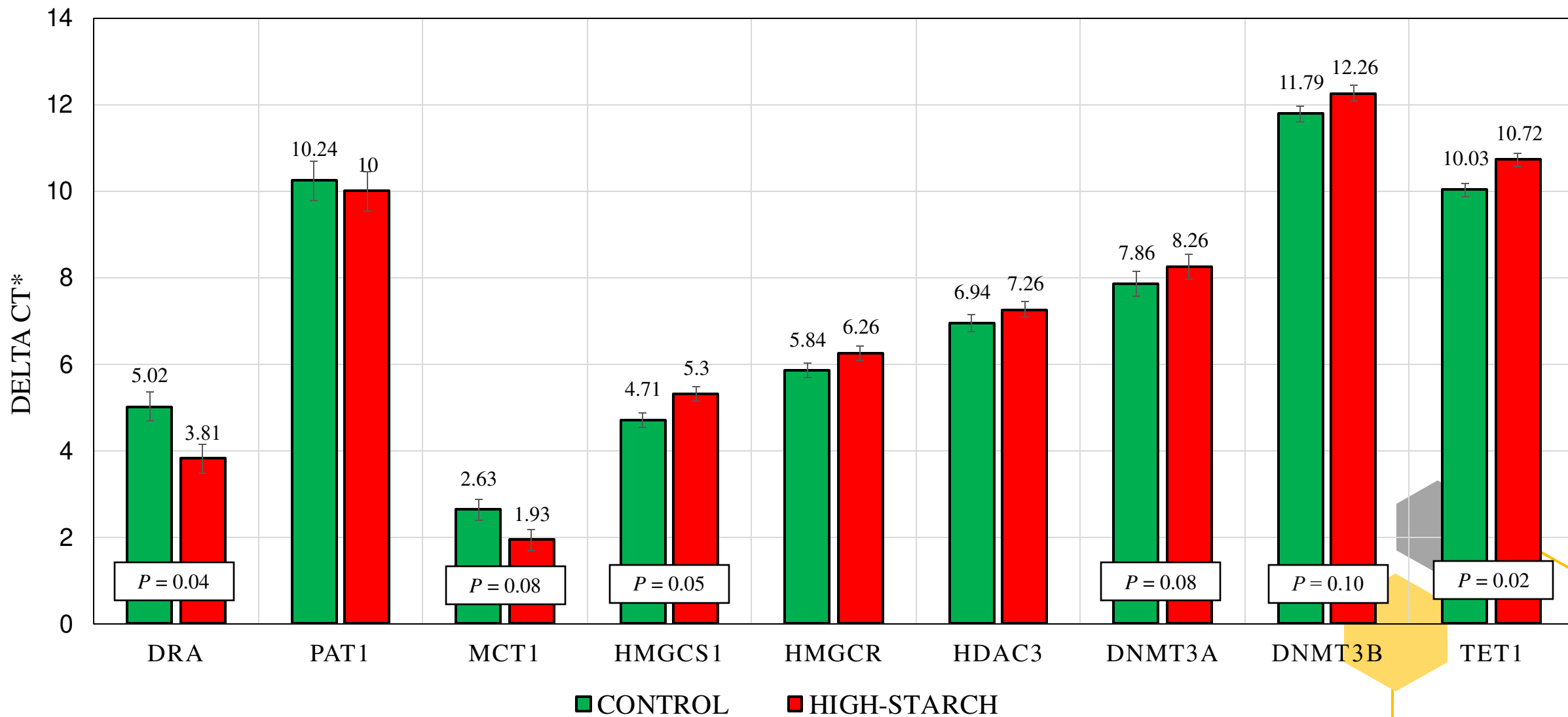


Research methodology

- ✓ Body weight control
- ✓ Feed intake monitoring in individual pens
- ✓ Voluntary dry matter intake control
- ✓ Rumen tissue samples collection for gene expression analysis
- ✓ Data analysis with a MIXED model procedure in SAS

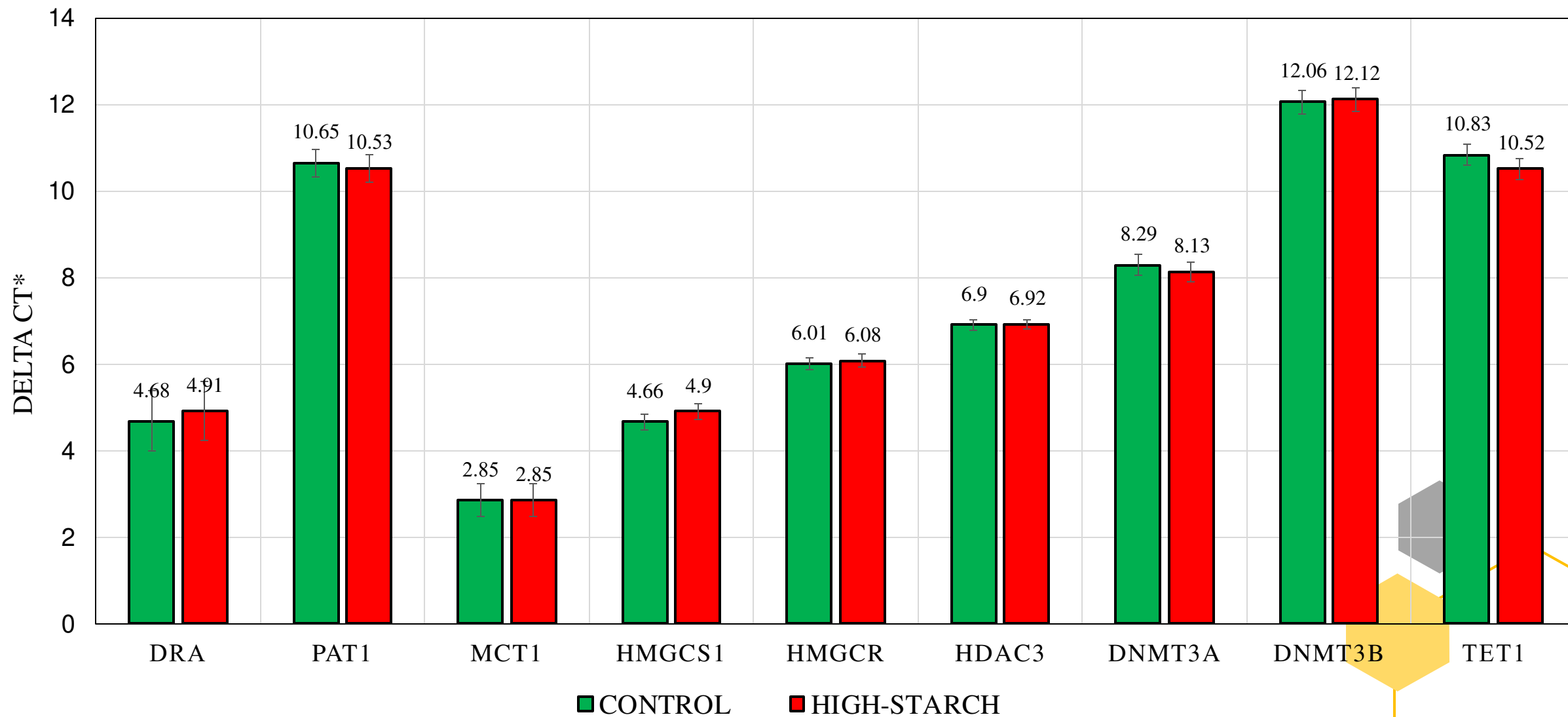


Results – Stage 1



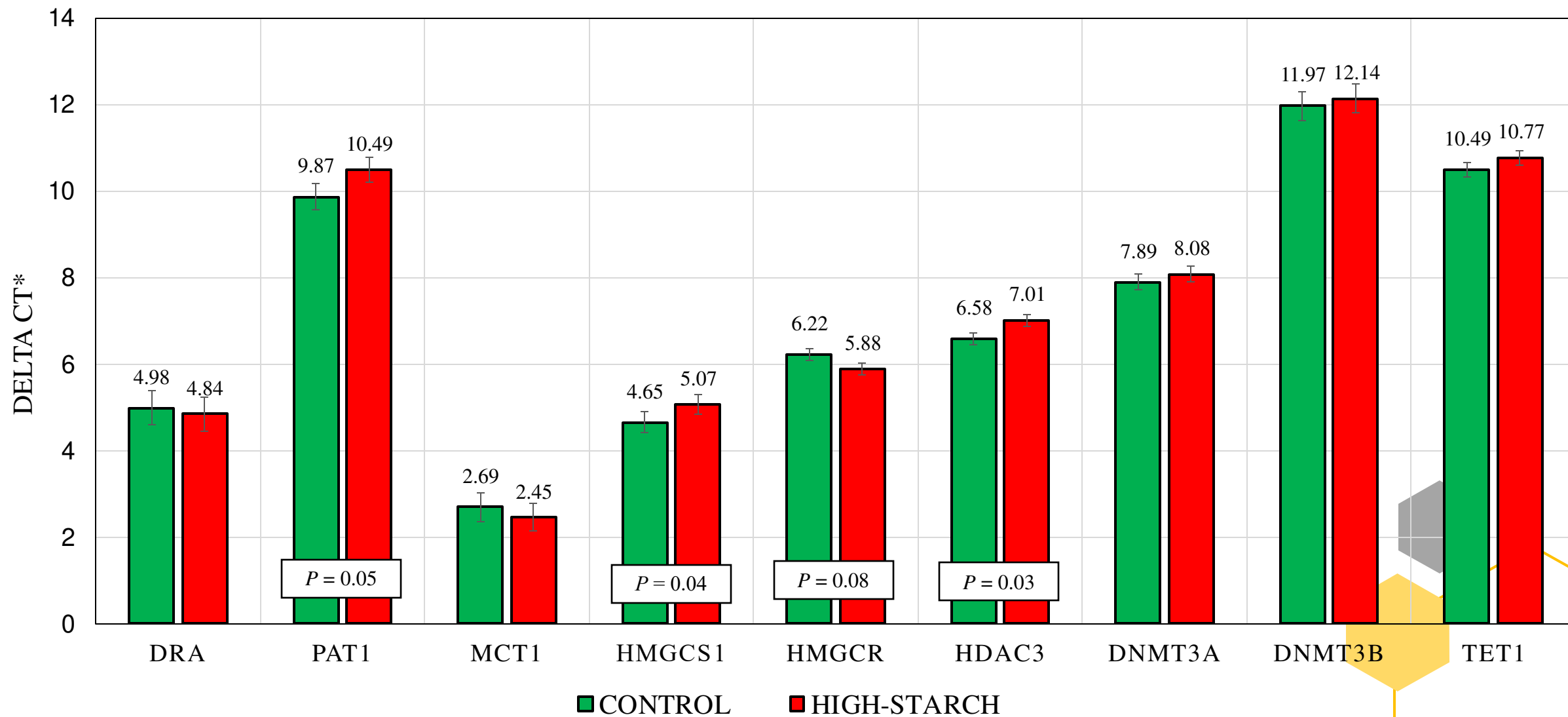
*Lower delta Ct = higher gene expression;

Results – Stage 2



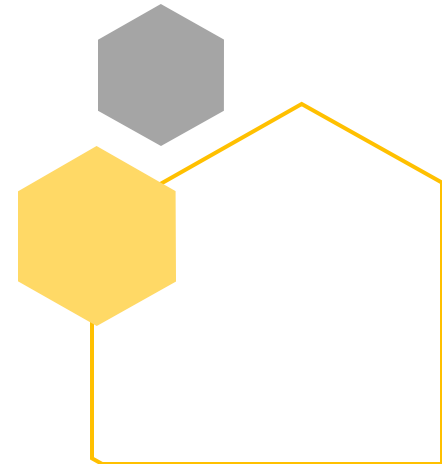
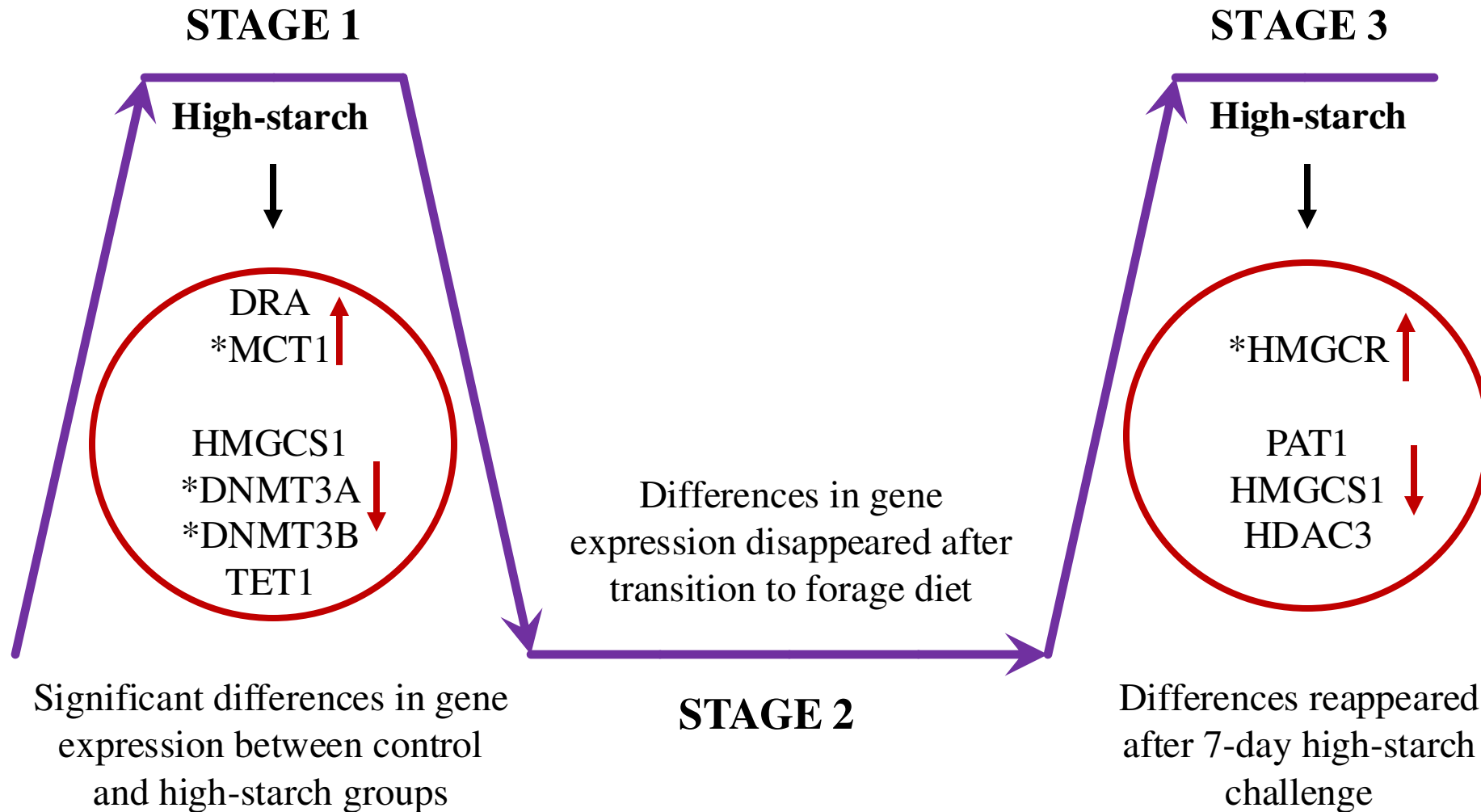
*Lower delta Ct = higher gene expression

Results – Stage 3



*Lower delta Ct = higher gene expression

Key findings



*Means tendency

Conclusions

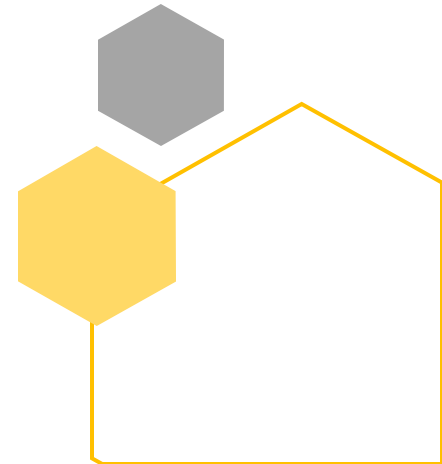
Early high-starch diet causes lasting changes in the expression of genes involved in:

- ✓ SCFA transport (**PAT1**)
- ✓ cholesterol metabolism (**HMGCS1, HMGCR**)
- ✓ epigenetic regulation (**HDAC3**)



These changes are not observed during forage feeding but reappear under dietary stress (high-starch challenge), demonstrating a „**metabolic memory**” of ruminal epithelium.

Answer main question: High-starch diet early in life result in long-term changes in selected gene expression in the ruminal epithelium of sheep.



Thank you!

Questions??

Does high-starch diet early in life result in long-term changes in selected gene expression in ruminal epithelium of sheep?

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