

Effects of polyphenol rich diet on the hormonal profile in heifers

Daniel Chiumia¹, Katrin Giller¹, Joel Berard², Tobias Zehnder², Susanne E. Ulbrich¹

¹Animal Physiology, Institute of Agricultural Sciences, ETH Zurich

²Animal Nutrition, Institute of Agricultural Sciences, ETH Zurich



1 Background

- Pregnancy failure is one of the common challenges in dairy cows.
- This research is addressing dietary polyphenols as indicators of the nutritional environment during early embryo development.

2 Hypothesis

The interaction of **polyphenol metabolites** with the ovaries and the oviduct tissue **results in changes in the steroid hormone profile**, thereby affecting the composition of the **oviduct fluid** and the **quality of the embryo**.

3 Methodology

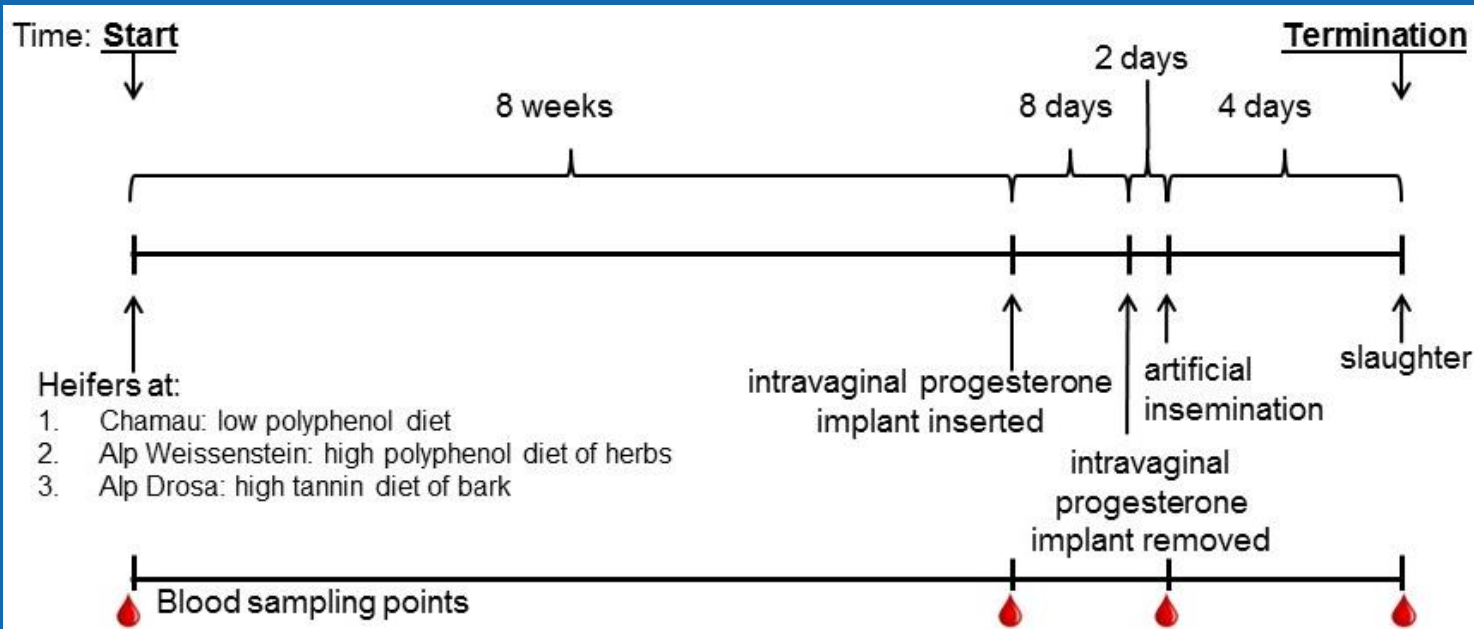


Figure 1: Experimental flowchart showing the summer grazing period, synchronisation protocol (after 8 weeks of grazing to insemination stage) and sampling.

Plasma progesterone concentrates were quantified using an enzyme-linked immunosorbent assay.



4 Preliminary Results and Discussion

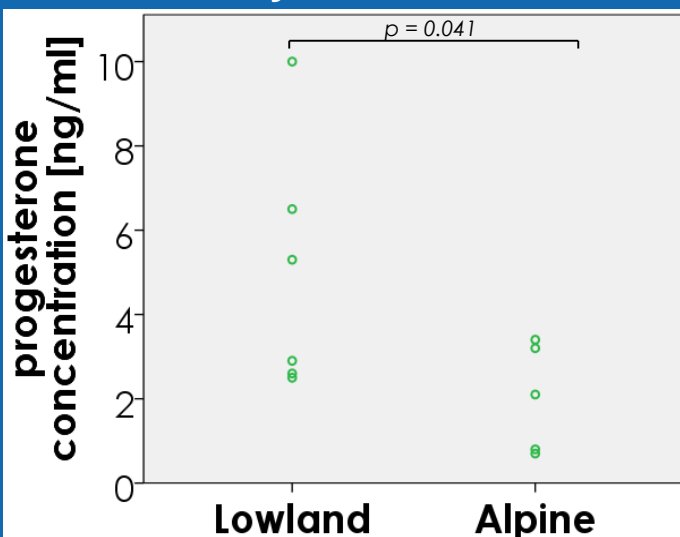


Figure 2: Day 4 post-insemination progesterone levels of Dexter breed heifers after grazing lowland and alpine diets.

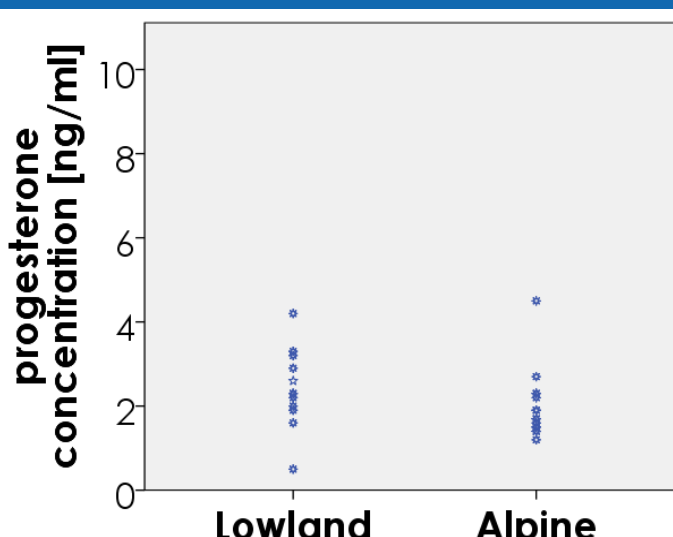


Figure 3: Day 4 post-insemination progesterone levels of Holstein breed heifers after grazing lowland and alpine diets.

- The diet type influenced progesterone levels in Dexter primiparous heifers.
- Dexters have a relatively higher capacity to eat the bark from trees and shrubs than Holstein.
- Concentration of tannins is mostly high in the bark.
- Bark polyphenole may affect ovarian function.

5 Food System Relevance

The influence of diet on the reproductive environment can be of use in identifying possible strategies for improving forage based feeding systems based on reproductive performance, i.e. ovarian steroid hormones and the effect on embryo quality.