

THE EFFECTS OF MILKING AND CLEANING PROCEDURES ON THE QUALITY AND MICROBIOTA OF RAW GOAT MILK

BACKGROUND

In the U.S., raw milk production is federally regulated by the FDA and interstate sale or distribution is illegal. However, each state may adopt their own regulations on the production and sales of raw milk. The State of Oregon defines the regulations around producing raw milk in the Oregon statutes O.R.S. § 621.012 and O.R.S. § 621.117. The former is the small farm exception, which allows sales on site of the premises and creates an exempt for farmers that manage under a certain number of lactating animals. The latter prohibits the sale to consumer of unpasteurized milk, *except* goat or sheep from a disease-free herd. Federal standards published in the Public Milk Ordinance (PMO) are publicly available for small-scale producers to test the efficacy of their procedures, although each producer establishes and maintains their own particular operating and cleaning procedures.

OBJECTIVE

The purpose of this study was to determine how variation of the milking and cleaning procedures between farms, influences the quality and microbiota of raw goat milk from small-scale producers.



METHODS

- Field samples were collected during July and August of 2021, with a total of 4 farms with different cleaning and milking procedures and 6 visits per farm. All milk and environmental samples were collected during the farm visit and immediately placed in an ice filled cooler upon collection. Samples were then delivered to the lab for further processing.
- Milk samples on the day of collection were plated on aerobic count, coliform, and yeast and mold count plates for bacterial enumeration.



- Milk samples within a month of collection were processed using a Lactoscope and Somascope in Dr. Bionaz's lab to determine milk components and somatic cell count (SCC).
- DNA was extracted from the milk and environmental samples, with further processing and microbiome data analysis that is ongoing.

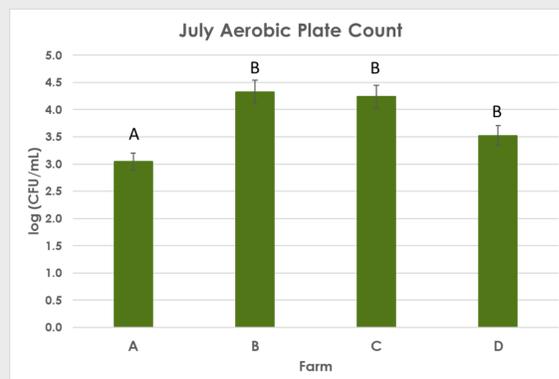


Figure 1. July Aerobic Plate Count

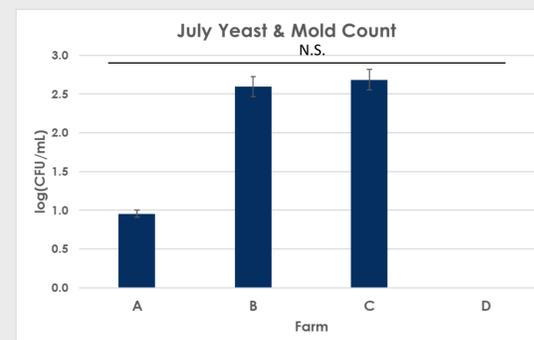


Figure 2. July Yeast and Mold Plate Count N.S. Not significant

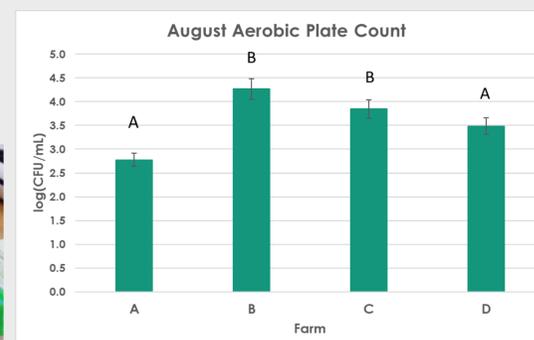


Figure 3. August Aerobic Plate Count

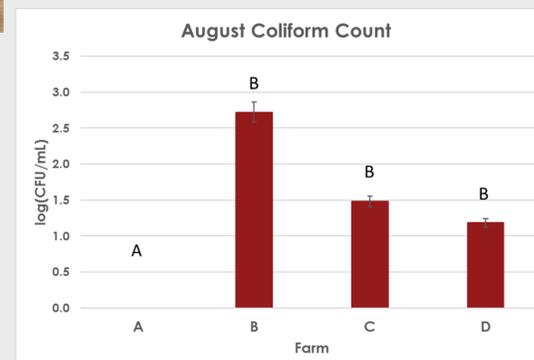


Figure 4. August Coliform Count

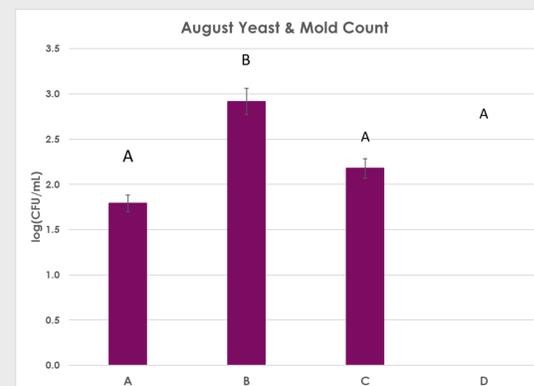


Figure 5. August Yeast & Mold Plate Count

RESULTS

A one-factor ANOVA and a Tukey test were used to determine if and where specific differences between farms were present. For the month of July, there was a significant difference found between the aerobic plate counts for Farm A when compared to Farms B, C, and D. There were no detectable coliforms for the month of July and no difference between the yeast and mold counts. For the month of August aerobic plate counts, there was a significant difference between Farms A and D when compared to Farms B and C, as well as a significant difference between the month of August coliform counts for Farm A when compared to Farms B, C, and D. August yeast and mold counts exhibited a significant difference between Farms A, C, and D when compared with Farm B.



A huge thank you to E.R. Jackman Alumni & Friends, College of Agricultural Sciences, the Beginning Undergraduate Researchers Support Program, Dr. Si Hong Park, Dr. Massimo Bionaz, and all the farmers and milking ladies that participated!

