



## EFFECT OF TH BREED, FEEDING AND THERMIC STRESS IN THE YELD AND COMPOSITION MILK'S PHSYSICAL-CHEMISTRY

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### Introduction

The main factors in the milk's natural composition are the feeding, breed and season of year, the time of lactation, the manage, etc [1]. The E o knowledge of these parameters that influence the milk is very important for framer use procedured that raise the quality and yeld of productos.

The breed influence the volume of yeld milk it yeld and nutrients compositions. However, milk's composition also can change between cows oh the same breed, when feeding food with different pasture.

The environment temperature affects directly in the productivity and composition of which had milk, mainly, to thermic stress. Thus, the milk cows tend significantly to reduce the milk production with the increase of the environment temperature. The lactose's concnetration also presents fall in bigger environment temperature. To each increase of 1°C in the ambient temperature they have a reduction of 0,08% of lactose in milk [2].

In this work has as goal to characterize the effects environment in composition and yeld in the Santa Catarina's, through, of verification of effects temperature environment, feeding and breed in change milk's yeld and composition

### Methodology

Milk samples had been collected, monthly, in 5 properties located in the west of Santa Catarina, during 20 months. These farms are classified as "small properties", that she is characteristic of the region.

Milk samples of two animals for property, proceeding from of first collect day, registering the breed of the animal, type of offered feeding, daily milk production and environment temperature of the day.

The titratable acidity was determined by titration acid-base [3]. pH was measured through pHmetro of the Quimis Model Q-400MT and investigated its variation in relation to the time. The lactose concentration was determined by the method of Fehling [4].

### Results and Discussions

In Figure 1, the variations of the productivity in function of the temperature are presented, for the breed Jersey and Holsty.

It is verified that as the environment temperature increases, the production goes diminishing, for both the breeds. This factor is consequence, mainly, of stresses it thermal. For other authors the production of 18,2 kg of milk 20°C had a fall for 16,7 kg of milk 35°C, a loss of 9% [5].

This fact is caused by the requirement of great metabolic

activity in the production and the increase of the temperature it has as consequence a reduction of this activity, diminishing the productivity [6].

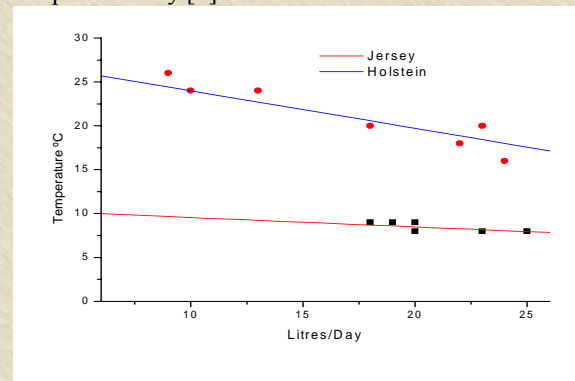


Figure 1 - Productivity in function of the temperature for the breeds Jersey and Holstein

In relation to the breed, the results show that the Holstein breed presents greater fall in the milk productivity, with a reduction of 1,44 L/day to each increase of 1°C of the environment temperature, whereas the Jersey race, presented a reduction of the productivity of 0,42 L/dia.

The titratable acidity of milk can vary between 0,12 and 0,23%. The milk produced for cows of the Jersey breed presents greater acidity of what of the Holstein breed. This must it the fact of that one of the components that contribute for the natural acidity of milk is the protein and the Jersey race is that it presents greater text of this nutrient; e also which had the feeding offered to the animal, therefore, this answers approximately for 50% of the protein variations of milk [7].

In Figure 2, it is shown the variation of the titratable acidity with environment ambient temperature for animals of the Holstein breed submitted the different methods of pastures.

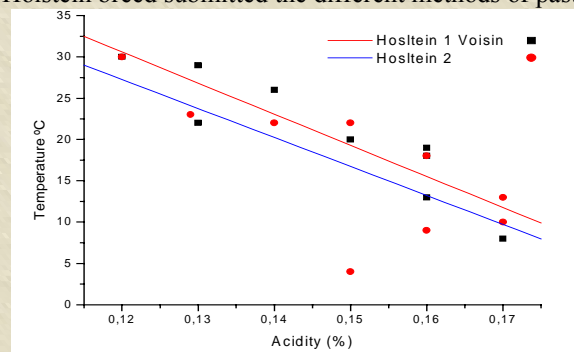


Figure 2 – Temperature vs Titratable acidity for Holstein Breed

The Holstein breed race presented a good definition in





the fall of the acidity, in different methods of pastures, only varying its initial and final values.

When carrying through a regression of the titratable acidity in function of the temperature, for animals of the Holstein breed, equation of the fit linear after the adjustment was  $y = 6,014 - 0,024x$ , indicating that for this breed, to the environment temperature, an increase of  $1^{\circ}\text{C}$  in the temperature implies in a reduction of  $0,024\%$  in the acidity. The coefficient of correlation was  $R = -0,91$ , indicating a good adjustment. The animals of the Jersey race had not presented a good linear adjustment

Figure 3 shows to the values of pH of the milk of animals of the breed Holstein and Jersey for different environment temperatures.

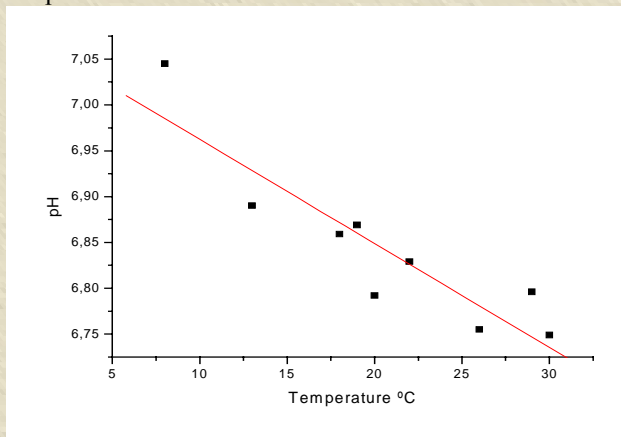


Figure 3- pH vs. Temperature for animals of the Holstein breed.

The pH of milk diminishes with the time as consequence of the increase of the acidity of the milk, caused for the conversion of the lactose en lactic acid for the microorganisms.

The regression of the value of pH in function of the temperature for animals of the Holstein breed, got the equation linear  $y = 0,041 - 7,8 \times 10^{-4}x$ . This indicates that pH diminishes  $7,8 \times 10^{-4}$  unit to each increase of  $1^{\circ}\text{C}$  of the environment temperature for this breed. The coefficient of correlation was  $R = -0,91$ , indicating a good adjustment. The Jersey breed did not present a good linear adjustment for pH. In Figure 4, the lactose texts are presented in function of the environment temperature.

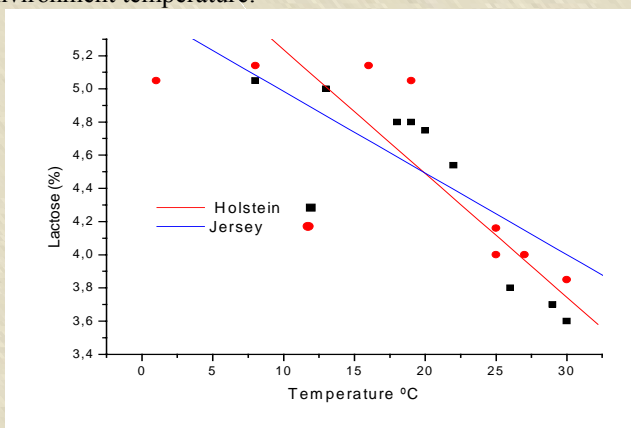


Figure 4 – Concentriom of lactose vs. temperature

The lactose is a sugar that can vary in amounts of  $4,7$   $5,2\%$  in the milk of the cow, being the constituent of milk with the lesser variation. But, milk produced in the summer tend to present a minor concentration lactose concentration [8]. The periods of bigger environment temperatures present minor lactose in milk having an increase in more cold days.

After to carry through the regression of the concentration lactose, in function of the temperature for animals of the breed Holstein, the equation linear after the adjustment was  $y = 7,07 - 0,04x$ , indicating that for this breed, to the ambient temperature, an increase of  $1^{\circ}\text{C}$  in the temperature implies in a reduction of  $0,04\%$  in the lactose concentration. The coefficient of correlation was  $R = -0,91$ , indicating a good adjustment. A good adjustment for the Jersey race was not found.

### Conclusion

- The breed of the animal and the variations in the temperature directly affect the composition of milk, as well as the productivity;
- The lactose concentration is bigger in the winter due the pastures to have greater nutritional quality;
- The milk production diminishes with the increase of the which had temperature, among others factors, to stress it thermal;
- The variation of the productivity is bigger for animals of the Holstein breed;
- Animals of the Jersey breed mainly present greater acidity, due to the biggest protein concentration;

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