

STUDIES REGARDING THE EFFECT OF TEMPERATURE ON THE QUALITY OF GREEN CHEESE DURING A CONSTANT BOILING PERIOD

LEONTE MIHAL, PIRCU NICOLETA, ARUȘ VASILICA ALISA

University of Bacău, Calea Mărășești, 600115, Bacău

ABSTRACT

As a result of the latest research in the field, one noticed that the most rational way of making good use of whey is the food industry. In this respect, one took interest in the whey, in the by-products resulted from the making of fresh cheese, aiming at the obtaining of green cheese, a highly nutritious aliment. The optimum results regarding the efficiency of green cheese were obtained keeping in mind certain parameters such as: boiling temperature: 80 °C and boiling time one hour.

Keywords: whey, valorization, green cheese, whey proteins, quality.

1. INTRODUCTION

In the last couple of years, the dairy industry achieved great progresses on account of the new technologies, the new products, the improvement of the efficiency during fabrication, the quality of the resulted products and also on account of the improvement of the economy efficiency for dairy products[1].

Nowadays one estimates that 10 million tons of cheese is made and that there is a quantity of 85-90 million tons of whey that, by its being released in the environment it could cause serious problems, taking into account that one litre of whey has biochemical oxygen demand 50,000 mg/l, compared to the city affluent 300 mg/l[1,4].

Whey is the watery part that separates during the conventional preparation of dairy products. It represents almost 85-90% of the used milk and it contains almost 55% of the dry substance of milk.

In whey one can find more whey proteins (lactalbumin and lactoglobulin), mineral substances and hydrosoluble vitamins than in milk. It is a green yellow liquid, it is acid, and should it come from fresh milk, (almost 20 °T), and should the milk be sour, its acidity level goes to 50-70 °T[2].

As whey cheeses are concerned one should mention that there are products that use whey as such or that use a mixture of whey and milk.

These types of cheeses have a high amount of proteins, and sometimes there is an important part of protein, mineral salts, vitamins and lactose [9,10,11].

Among the cheeses generally made from whey one should mention green cheese and Ricotta cheese. Green cheese is a product obtained by the precipitation, under the action of heat, the albumin from the whey resulted from cow/sheep milk cheeses and it is produced only by its heating at 80 °C during one hour[2,3,4].

2. MATERIALS AND METHODS

In the experimental program one used whey resulted from the fabrication of unsalted cow's cheese [5,6,7]. The chemical composition of the whey used on the experiment is shown in table 1.

Table 1. Chemical composition of whey

Ingredients, %	Sweet whey
Water	92
Dry material	7,05
Fat material	1,5
Protein	2,01
Lactose	5,44
Mineral salts	0,6

In order to achieve the experiment one used 5 samples of cow's whey that were heated to different temperatures in order to obtain green cheese as shown in table 2.

Table 2. The variation of the technological parameter

Technological parameter	Samples				
	1	2	3	4	5
Boiling temperature, °C	55	65	80	90	95

For each sample one maintained constant the whey quantity (9 litres) and the boiling time (one hour).

3. RESULTS AND DISCUSSIONS

In order to determine the optimum conditions for the obtaining of green cheese as far as the variation of the boiling temperature is concerned one looked into the following parameters:

- Acidity
- Dry substance
- Fat content reported to dry substance
- Water content

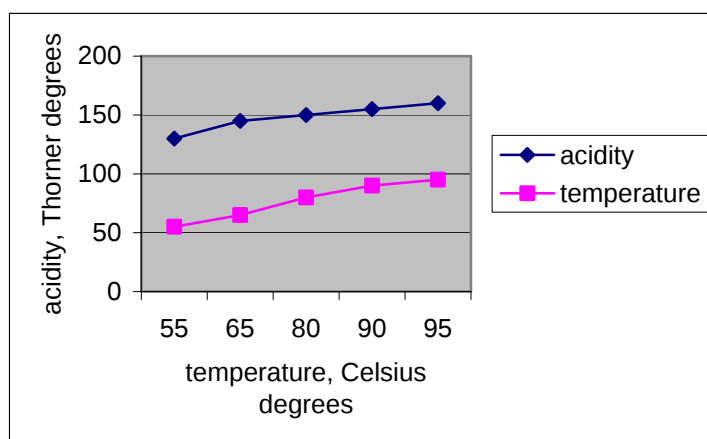


Fig. 1 The influence of temperature on acidity

The results obtained for each parameter are graphically shown.

From figure 1 can be observed an increase of temperature in the mean time a increase of acidity.

In this case the green cheese at 80 °C with 150 °T acidity has the best quality.

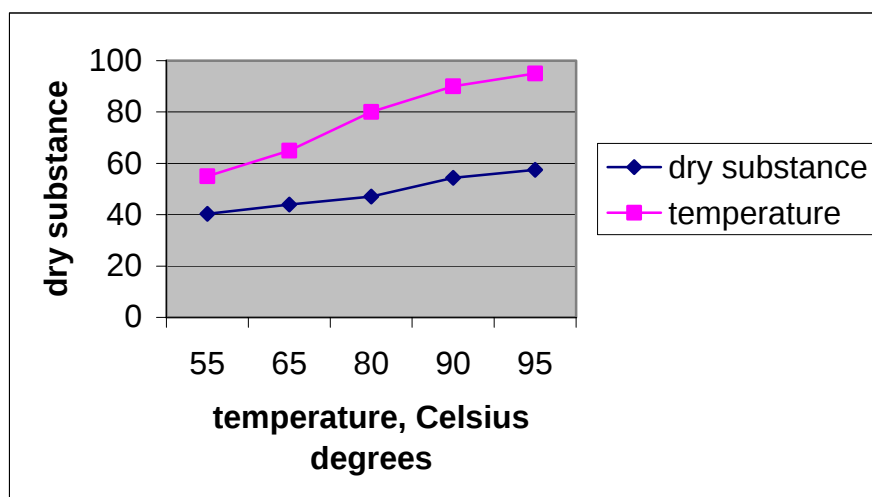


Fig.2 The influence of temperature on dry substance

From figure 2 can be observed an increase of temperature and in the mean time an increase of dry substance.

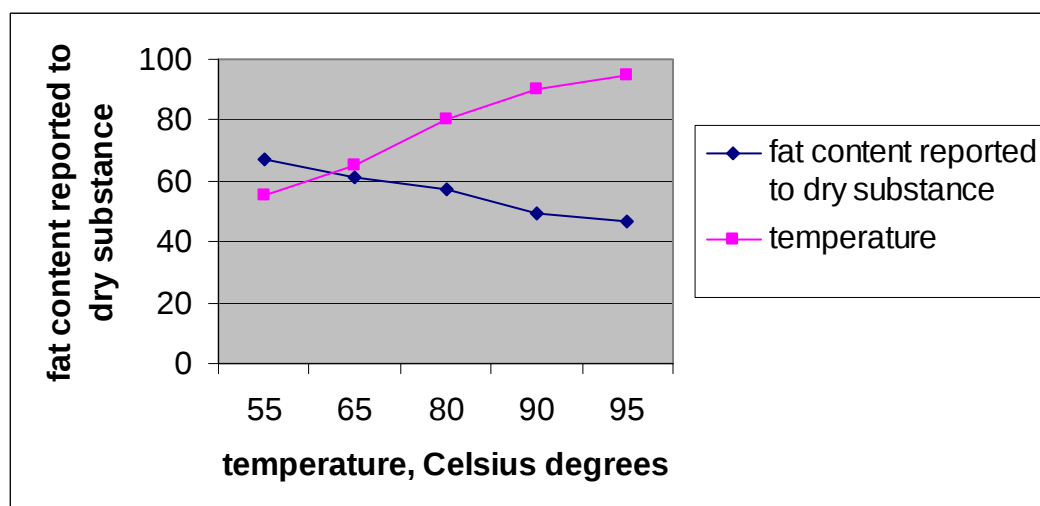


Fig. 3 The influence of temperature on fat content reported to dry substance

From figure 3 can be observed an increase of temperature and in the mean time a decrease of fat content reported to dry substance. The optimum value of this report is 57.58.

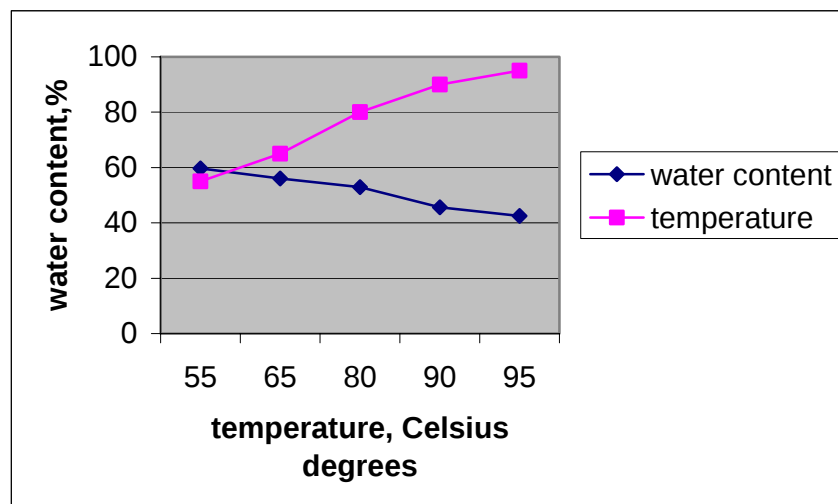


Fig.4 The influence of temperature on water content

From figure 4 can be observed an increase of temperature and in the mean time a decrease of water content.

CONCLUSIONS

The conducted research lead to the conclusion that the whey resulted from the production of unsalted cow's cheese can be successfully used in order to obtain green cheese.

As a consequence of the thermal applied treatment one noticed that the optimum parameters are temperature 80 °C and the boiling time 1 hour.

In order to obtain this product and commercialize it as far as the lactose intolerant segment of the market is concerned; one should make an impact regarding the social, economic and technical conditions.

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