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THE INFLUENCE OF THE PARAMETERS AND THE WORKING MODE ON THE QUALITY OF THE FINISHED PRODUCT IN THE MANUFACTURE OF SUGAR BISCUITS

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Abstract

The paper studied the influence of the working parameters, the order of introduction of the ingredients in the dough and the way of working on the quality of the finished product in the production of sugar biscuits. The procedures for manufacturing, handling and packaging of sugar biscuits are described. The paper explains in general terms what the biscuit manufacturing involves from raw material dosing to the storage of the finished product. Sugar cookies have been designed to meet current market needs, consumers, and for this purposethey have specifications for product quality, packaging size, appearance, types and quantities of ingredients. These specifications define the limits and it is the task of the production department to ensure that only the biscuits that meet the specifications are packaged and sold. Any inappropriate product is eliminated in other ways and will represent a financial loss for the producing companies.

***Key words*:** *sugar biscuits, ingredients, fat*

INTRODUCTION

To make the sugar dough, it is needed to use the sigma-arm mixer. The hygienic condition of the mixer before introducing the raw and auxiliary materials and sanitize is necessary. The raw materials are introduced according to the working method specified in the recipe, considering the temperature of the raw material, the dosage, the preparation of the raw material, the ingredients of the ingredients and the mixing time [4].

The temperature of the raw material influences the consistency of the dough. The raw materials to which the temperature specified in the recipe is to be observed are: palm vegetable fat and water. The temperature ranges are recited in the working mode.

Dosage is more than important for making any product. Any overdosing/underdoing has noticeable effects on the operation of the production line and the quality of the product. Dosage of the raw material, the specified quantity of which in the recipe is less than 15 kg, is made on scales with an accuracy of 5 grams and, over this quantity, the weighing scale is used [5].

Preparing the raw material which requires a pre - training.

The placement in the mixing bowl is in the following order of the ingredients: palm vegetable fat, water, chemical livers and cinnamon.

Palm plant fat requires a special temperature as specified in the recipe. If the temperature is not within the set range, the dough consistency will change [1].

Chemical dusts is dissolved in water. In the container in which dosing is made, dissolution is also carried out. Add a quantity of water from the total amount of water in the recipe and mix with the hand.

Cinnamon is mixed with the amount of sugar that is added in the first stage to the assortment to which it is used.

The raw material input order influences the dough processing on the forming part and the size of the finished product. Follow the order of feedstock and the two or three phases, depending on the assortment manufactured, as specified in the recipe [3].

The kneading time is set and passed into the manufacturing recipe. Failure to comply the

mixing time influences the consistency of the dough.

The dough temperature at the end of the kneading will be 25 ± 2°C. The dough cups must be ignited both at the start of manufacture and at stopping and will be kept clean. At the end of the work the mixer will be ignited [2].

MATERIALS AND METHODS

Sample I

Phase I: Water soluble dishes (Tapa=40 ± 3°C) together with palm vegetable fat at temperature=40-42°C and the rest of the raw materials, less the flour and 30% of the total amount of sugar, are placed in the mixing bowl and the kneading starts. The kneading time is 9 minutes.

Phase II: Insert the flour and the rest of the sugar and continue the kneading for another 3 minutes.

Sample II

Procedure

Phase I: Watermelons dissolved in water (T_{water} = 40±3 °C) together with the palm vegetable fat at temperature = 38-40 °C and the rest of the raw materials, less the flour and 30% of the total amount of sugar, are placed in the mixing bowl and the mixing is started. The kneading time is 9 minutes.

Phase II: Insert the flour and the rest of the sugar and continue the kneading for another 3 minutes.

RESULTS AND DISCUSSIONS

This change has influenced a range of parameters both at the biscuit formation area and the finished product. In the dough with fat = 46-48 ^oC, the temperature being well above the melting point (39-40 ^oC), the dough was fatter, the fat liquefied which influences the structure of the dough and finally the quality of the finished product.

Coming with a higher inlet temperature, a dough with a higher temperature (29-30 °C) resulted in a complicated machining and adherence on the working parts of the machinery.

The difference in weight, diameter and thickness were most affected.

The temperature of the palm plant fat has changed with a decrease of approximately 80 °C, compared to the actual recipe.

The melting point of the palm plant fat used in this product is 39 ^oC.

The dough temperature and humidity are monitored after kneading.

In the training area the diameter, the weight of the dough piece after its output from the alveoli is monitored.

If the piece of dough is below the proper weight, it will work on the machine to reach the desired weight.

After baking we will follow the technological parameters: diameter, thickness, weight, humidity, to control the quality of the manufactured product.

Table 1. Recipe for biscuits with honey and cinnamon

Crt. No.	Material	MU	Amount	Working modeling
1.	Palm vegetable grass	kg	0	
2.	Caramel syrup	kg	0	
3.	Granulated sugar	kg	0	
4.	Glucose-fructose syrup	kg	0	
5.	Ammonium bicarbonate	kg	0	**Phase I** 9 Min
6.	Sodium bicarbonate	kg	0	
7.	Salt	kg	0	
8.	Cinnamon	kg	0	
9.	Apple flavor	kg	0	
10.	Honey	kg	0	
11.	Water	kg	0	
12.	Granulated sugar	kg	0	**PhaseI** 3 Min
13.	Flour type 650	kg	0	

Table 2. Comparison of parameters with change of fat temperature

Technological parameters	Alveole dimensions	T_{fat} = 46-48^oC	T_{fat} = 38-40^oC
Diameter	43 mm	50-53 mm	44-45 mm
Thickness	3.8 mm	6-6.2 mm	5.2-5.4 mm
Weight	5g/buc	6.4-6.7 g	5-5.2 g

The order of sugar granulated intake was changed, where the sugar in the first kneading phase was introduced 70% of the amount and in the second phase 30%:

Table 3. Comparison of parameters with change of order of sugar introduction

Technological parameters	Alveole dimension	Phase I - 100% sugar	Phase I – 70 % sugar Phase II – 30 % sugar
Diameter	43 mm	47.5-49 mm	44-45 mm
Thickness	3.8 mm	5.5-5.7 mm	5-5.2 mm
Weight	5g/piece	4.5-4.7 g	5-5.2 g
Hardness		low	high

Baking times are generally longer, as lower temperatures are required to prevent excessive coloring.
Baking time is related to the thickness of biscuits, and sugary biscuits can be very thick and are generally thicker than other types. Baking profiles are usually flat at about 180 ° C for all furnace areas.


Photo 1. Phase I (orig.)

During the cooling of the biscuits, in addition to lowering the temperature, humidity also changes.
A uniform distribution process takes place in the mass of biscuits by migrating the vapors from the center layers to the outer layers. The end of this temperature change takes place after about 30 minutes and depends on the thickness of the biscuits and the temperature, and possibly on the cooling air speed [7].
It is recommended that during the cooling, the biscuits are kept in a space or area where the air temperature is at most 30-40^{0}C, humidity 70-80%, and air velocity of 2.5 m/s, the air being directed the countercurrent with the displacement of biscuits [6].


Photo 2. Phase II (orig.)

CONCLUSIONS

The objectives of this work, research have been achieved fully. We have succeeded in offering a new, quality and safe product to consumers. We have succeeded in bringing it to the parameters proposed by the company, the consumers, by us. We have found the best solutions to make this product to correspond both to the qualitative and quantitative standards.
We can see how much an ingredient plays, the processing temperature and how it works to produce compliant products.
Therefore, products rich in fat and sugar have less water in the dough. This means that the protein is imperfectly hydrated to form gluten and when the dough is heated there is not enough water to gelatinize much of the starch. The structure is based more on a sweet or caramelized matrix that becomes softer than it sets with the rise in temperature. Thus, during the baking of short sugar-rich doughs, an expansion is observed in all directions, followed by an increase in thickness. The spread of the dough and the growth are responsible for the cracked surface of the biscuits.

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