THE TECHNOLOGY OF MAKING A PASTRY PRODUCT FROM TENDER DOUGH

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Abstract: *This study presents a technology on obtaining a cookies based on tender dough. Pastry products are very appreciated for their senzorial qualities and they are widely consumed worldwide. Cookies are part of pastry which are consumed as a dessert, at breakfast along with a drinks or as a snack between meals. In order to carry out this study cookies with chocolate from tender dough were prepared. Wheat flour, fat, sugar, eggs, chocolate flakes and baking agents were used as raw material. Was elaborated the technological flow diagram. The receipe and the parameters for each step of process were established. Beased on total technological losses the specific consumption and yield of the processing the cookies were calculated. After preparing the sensorial characteristics of the cookies were assessed. It was calculated the nutritional value of the cookies.*

Key words*: cookies, pastry, dough, senzorial characteristics, nutritional value, technological process*

INTRODUCTION

Pastry represents the range of flour products resulting from baking of a dough prepared using as primary ingredients flour, water, fat and salt [2, 10]. Another definition of pastry characterizes these products as being a mixture of flour, fat and water, which by kneading turns into a paste [8,13]. This raw material are used in varying proportions and often are combined with other ingredients as eggs, sugar, milk, yeast and chemical leavening agents in order to obtain flexible doughs which are shaped in different shapes and then are baked [2]. By using different methods of mixing and by associating doughs with different aditions a wide range of pastries are obtained [8, 13, 16]. Properly processing of the pastry has started in the mid 16^{th} century, but there historical data which confirm that ancient Mediterraneans, the Phoenicians and the Greeks was using to prepare traditional pastries [5, 15]. Also, in the 14^{th} century, the Egiptiens creates the first raw pastries prepared from cereals flour associated with honey, fruits and spices [13]. The main sorts of pastries includ cookies, shortcrust pastry, flaky pastry, puff pastry, choux pastry and phyllo pastry [1, 5, 17]. Pastries are characterizing by a high sugar and fat content [7, 13]. Tender dough is the base for soft pastries which is prepared using as raw material flour, fat, salt and very little water and that become crispy when is baked [1, 10, 12].

MATERIALS AND METHODS

To conducting this study a sample of cookies with chocolate were prepared. The used technology was the one of the tender dough [3, 6, 11]. After processing the cookies were assessed from sensorial point a view using the descriptive test. The evaluation was carried out by ten panelists who assessed the cookies samples based on their key attributes (appearance, odor, flavor, texture and aftertaste) [4].

Before performing the analysis the panelists were trained about key attributes of the cookies sample and were calibrated so as to be able to assess each characteristic depending on intensity in range from 1 to 5 [9].

The evaluated attributes of the cookies samples are presented in Table 1.

Table 1

The attributes used in order to assess sensory profile of cookies with chocolate

Category	Attribute name	Description
Appearance	Comercial appearance	Evaluated based on panelists opinion regarding the attractiveness to buy
	Overall appearance	Assessed based on the panelists personal opinion regarding the cookies
	Sectional aspect	Assessed after the cookies cuting in respect of the pore uniformity
Odor	Overall odor	Assessed based on the panelists opinion regarding the intensity of the cookies smell
	Specific aroma	The intensity of ingredients flavour before eating
	Others (specify)	The panelists will specify will specify any foreign smells perceived
Flavour	Overall taste	Cookies flavour intensity including cococa feeling during chewing the cookies
	Sweetness	The panelists will specify will indicate the intensity of the sweet taste perceived
	Others (specify)	The panelists will specify will specify any foreign flavour perceived
Texture	Hardness	The cookies texture at the first bite
	Melting time	The time necesary to chew the cookies
Aftertaste	Persistency	The taste intensity remaining after swallowing the cookies

The scale is: 5 – Excellent; 4 – Very Good; 3 – Good; 2 – Satisfactory; 1 – Not satisfactory [4]

The energy and nutritional values were determined by calculation using the nutrients values form United States Department of Agriculture Food Composition Databases [14].

RESEARCH RESULTS

The amount and proportion of ingredients used in the recipe used for cookies with chocolate preparation are shown in Table 2.

Table 2

The receipe of cookies with chocolate samples

Ingredient	Amount [kg]	Proportion [%]
Flour	0,5	45
Butter	0,3	27,5
Sugar	0,06	5,5
Eggs	0,06	5,5
Chocolate flakes	0,15	14
Salt	0,01	1
Baking agents	0,01	1
Vanilla flavour	0,005	0,5
Total raw material	1,095	100

As it can see in Table 2 the flour:fat (butter) ratio was abut 2:1 which is specific to the tender dough. The big quantity of used fat had the role to give tenderness to the dough and and friability to the finished product. The sweet taste of the cookies was provide by sugar together with milk chocolate flakes.

The steps of the technological process of obtaining cookies are presented in flow diagram from Figure 1.

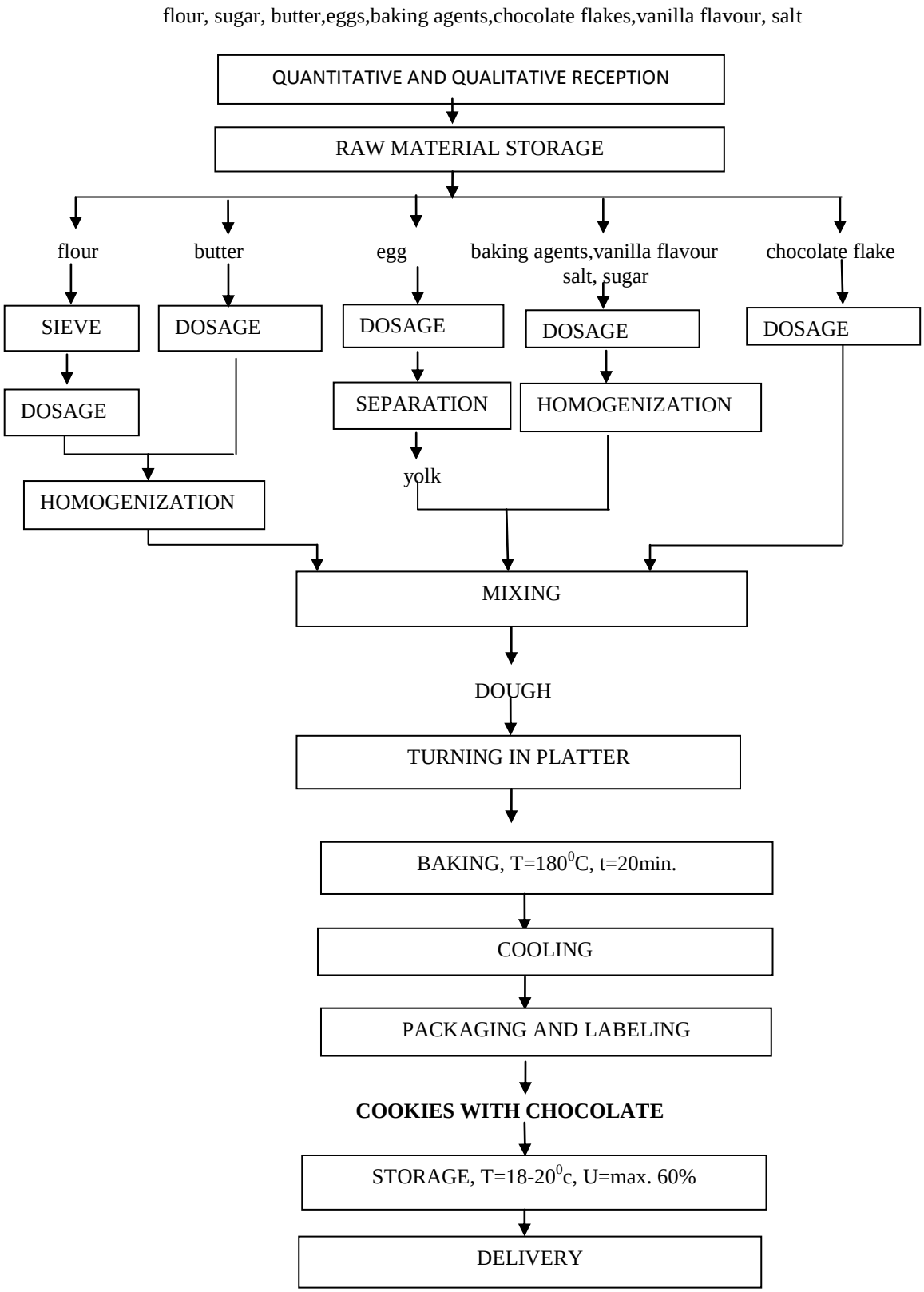

Figure 1. The technological flow diagram of cookies with chocolate processing

The technological raport of cookies samples preparation is shown in Table 3.

Table 3

The name of the table

Product name	Raw material quantities [kg]	Final product quantity [kg]	Specific consume	Yield [%]	Losses [%]	Technological parameters
Cookies with chocolate	1,095	1,0071	1,09	92	8	$T=180^0C$ t= 20minutes
Comments	The consistency of the dough before baking was soft and easy to shape. After baking, product had a uniform appearance of the surface without cracks and a brittle consistency. After cooling the sample does not change its volume.					

The used technological regime has led to a quickly formation of the dough crust which did not allow that the release of CO_2 formed by decomposition of the baking agents to produce cracks in the surface of the product. Also, at 180^0C there was a uniform and deep baking of the core which had as effect the maintaining of product volume after cooling. The process yield was relative high and it is due to the absence of the liquid in the receipe.

After processing the cookies samples have kept at room temperature, to the dark for 24 hours until sensoric profile evaluation, the assessement results being presented in Table 4. The graphical representation of sensorial attribute values is shown in Figure 2.

The sensory evaluation results are presented in Table 4 and the graphical representation of sensorial attibute values of the cookies sample in Figure 2.

Table 4

The sensory evaluation sheet of the cookies with chocolate

		COMERCIAL APPEARANCE	OUTER APPEREANCE	SECTIONAL APPEREANCE	GENERAL SMELL	SPECIFIC SMELL	OTHER SMELLS	GENERAL TASTE	SWEET TASTE	OTHERS	TEXTURE	PERSISTENCE	
COOKIES WITH CHOCOLATE	PANELIST	APPEARANCE			SMELL			TASTE			MELLOW	TASTE AFTER SWALLOWING	Comments
	1	5	5	4	5	4	0	4	4	0	4	5	
	2	4	5	5	4	4	0	4	3	0	4	4	
	3	5	5	3	4	5	0	5	3	0	3	5	
	4	5	4	5	5	5	0	5	4	0	5	4	
	5	4	5	4	4	5	0	5	4	0	4	5	
	6	5	4	4	5	5	0	4	5	0	5	5	
	7	4	4	4	4	4	0	5	5	0	5	5	
	8	4	4	5	5	5	0	4	5	0	4	4	
	9	5	5	4	3	4	0	5	4	0	5	5	
	10	4	4	5	4	5	0	5	4	0	5	5	
Confidence Interval for ->			95%										
	AVG.	4,5	4,5	4,3	4,3	4,6	0,0	4,6	4,1	0,0	4,4	4,7	
	STD.D	0,5	0,5	0,7	0,7	0,5	0,0	0,5	0,7	0,0	0,7	0,5	
	Conf Int	0,3	0,3	0,4	0,4	0,3	0,0	0,3	0,5	0,0	0,4	0,3	
		Sig	Sig	Sig	Sig	Sig		Sig	Sig		Sig	Sig	

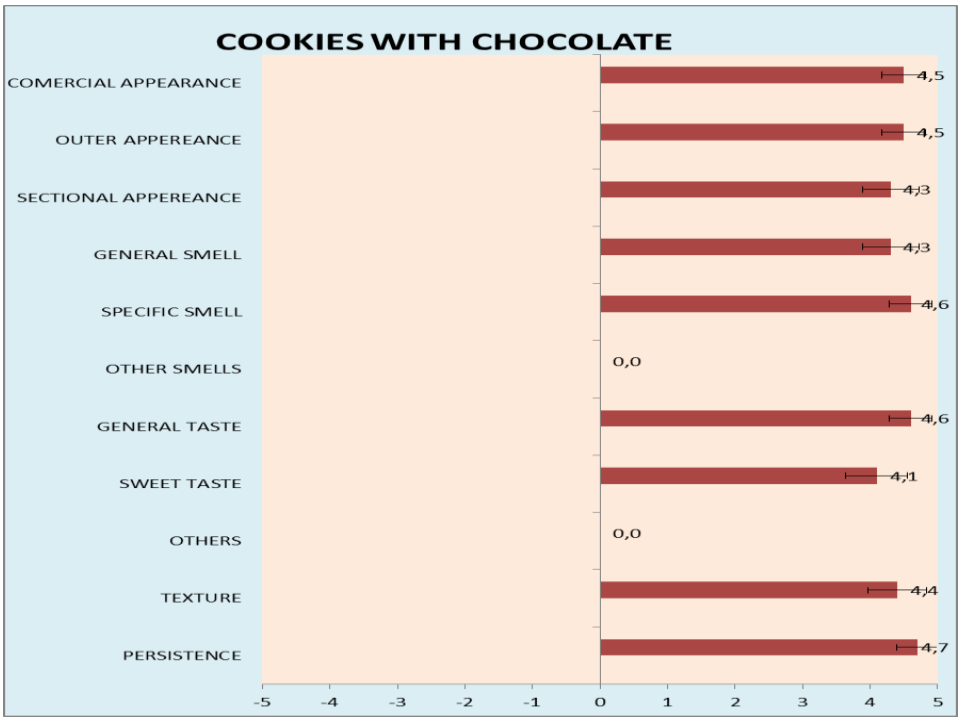

Figure 2. The graphical representation of sensorial attibute values of the cookies sample

The marks give by the 10 panelists to the evaluated sensorial attributes of the cookies sample reveals that the persistence of taste after swallowing and the general taste of cookies were the most appreciated, obtaining an average score of 4.7 and 4.6 respectively. Sectional aspect and general smell have been appreciated with the smallest notes getting on average 4.3 marks and could be assigned to the brittle of the dough and to the low flavor used in the receipe. The foreign odor and taste were not perceived in the cookies sample. All panelists appreciated that the cookies sample had very pleasant sensorial profial and have an attractive commercial appearance.

The energy and nutritional value of the cookies with chocolate (presented in Table 5) were calculated using the using the nutrients values form United States Department of Agriculture Food Composition Databases in compliance with the legislation regarding the amount of caloric calories corresponding to total lipids, carbohydrates and proteins content. The obtained values are represented by comparation in Figure 3.

Table 5

The energy and nutritional value of the cookies with chocolate

Nutrient	g/100 product
Total lipids	24,6
Saturated fatty acids	15,2
Carbohydrates	49,2
Sugar	14,8
Fiber	2,2
Proteins	6,2
Salt	1,0
Energy value	450kcal/100g 1880kJ/100g

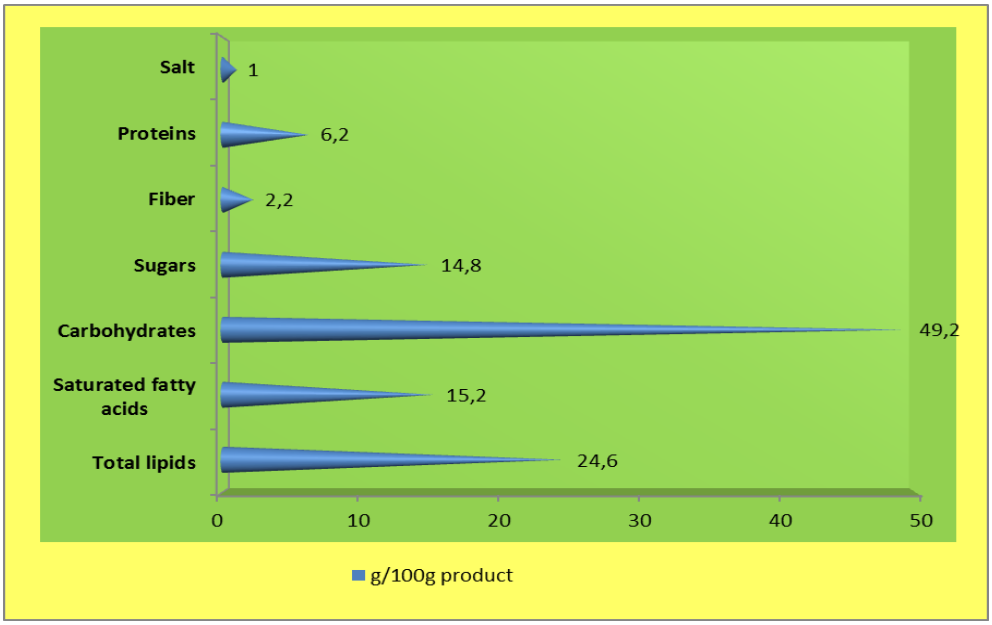

Figure 3. Graphical representation of nutrient values from cookies samples

As it can see in Figure 3 the major nutrients from cookies sample ar carbohydrates (49,2g/100g produs), which coming from chocolate, sugar and flour used in receipe. From total carbohydrates the highest quantities is provided by sugar (14,8g/100g produs), for which reason the cookies are not recommended to the people with diabetes. The coookies with chocolate evaluated in this study have a considerable total fat content (24,6g/100g), from which 61,8% are represented by the saturated fatty acids coming from butter. The proteins content of the cookies sample (6,2 g/100g) is low compared to other nutrients. And can be attributed to the flour, eggs and butter.

CONCLUSIONS

Because of the high energy and nutritional value, and the pleasant sensory properties, cookies can be considered foods that bring to the human body along with the nutritional and energetic intake, being recommended for people who live an active life both intellectually and physically.
However, because of the high sugar and fat content, the cookies are not recommended for children under the age of 3 and for diabetics.

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