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ROMANIAN CONSACRATED RECIPES IN THE MILLING AND BAKERY INDUSTRY

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Abstract

Romania has implemented a legislation whose purpose is to recover the recipes of some food products, in their original form, functional before 1984. The original recipes are known as "Romanian consecrated recipes". The purpose of the present study was to evaluate how the producers in the milling and bakery industry complied with this legislation, 5 years after its appearance. Our results show that the number of foods certified as being obtained with "Romanian consecrated recipes" is quite low, only 9 products, of which only 7 can be considered as completely belonging to the bakery industry. Also, the number of producers who hold consecrated recipes certificates is very small (21 producers compared to several thousand who work on the bakery market) and are distributed on less than half of the national territory. The vast majority of applications for consecrated recipes certification are concentrated on bakery products that contain potato derivatives. Only slightly over 18% of the old recipes and technologies are represented in the range of products certified according to the legislation in force. No milling industry product is certified as having consecrated recipes, although there is no equivalent in the products currently available on the market. The products obtained according to "consecrated recipes" have the quality to contribute to the diversified use of the available food resources and to the superior use of some by-products from the industry. However, these types of products are not necessarily correlated with the modern trends in the industry, in terms of energy efficiency or consumer expectations, being not "clean label".

Key words**:** *consecrated Romanian recipes, food products, milling and bakery*

INTRODUCTION

The consecrated recipes for certain categories of food products are described in the Romanian legislation by a series of normative acts issued by the Ministry of Agriculture. This is the joint Order of the Minister of Agriculture and Rural Development, the Minister of Health and the President of the National Authority for Consumer Protection no. 394/290/89 of 2014. This order regulates the conditions that must be met by the operators in the food sector, in order to register in the National Register of Consecrated Recipes certain categories of products, manufactured according to Romanian consecrated recipes. The legislation defines the Romanian consecrated recipe as being the food product manufactured in compliance with the composition used more than 30 years, before the date of entry into force of Order 394/290/89/2013 (before 1984). In order to be certified, the manufacturers must produce a technical documentation that includes: product name, description of raw materials and ingredients used, consecrated recipe, technological scheme, description of the technological process, sensorial, physical-chemical and microbiological quality indicators, respectively related elements for packaging, labelling, storage and transport.

The documentation must also describe the control procedures and methods [12]. In exchange for this documentation, the producers receive a certificate issued by the Ministry of Agriculture and Rural Development and the right to use a specific logo, on the label of the respective food products (Fig. 1).

Fig. 1. Official logo for the Romanian consecrated recipes
Source: [7].

The purpose of the present study is to evaluate the number of consecrated recipes on the market for milling and bakery products, 5 years after the appearance of this type of certification. We also set out to discuss a number of technological issues related to their implementation in the industry. At the same time, we intend to evaluate the future potential of approaching consecrated recipes also for other milling and bakery products.

MATERIALS AND METHODS

Our study is based on the critical evaluation of the data available in the public domain about the consecrated recipes, technologies, the level and the consumption behavior regarding the milling and bakery products. For this purpose, data available on the website of the Ministry of Agriculture and Rural Development, Eurostat, from the Romanian press and from the specialized literature of the milling and bakery field, have been processed. At the same time, we accessed the collections of standards, which regulated the recipes of milling and bakery products in the centralized type economy since 1989.
The paper has a critical approach of the published literature in the field and applied synthesis methods for setting up this paper.

RESULTS AND DISCUSSIONS

At the base of the economic agents interest for the consecrated recipes lies the tendency of the consumers to look for authentic foods, made according to old recipes and technologies. For example, the “Taste Tomorrow” study (2019) conducted at European level by the company Ipsos for the Puratos group, highlighted the interest of consumers for bakery products that provide less calories, fat and salt and more fibers, whole grains, seeds and protein.
Bread with leaven is considered by most consumers to be the bread of the future, based on three criteria: freshness, nutritional input and taste. The main consumers criterion for the bread choosing was identified as being the freshness [13]. Freshness is a bread characteristic which is described by a multitude of criteria, the most representative being the "starch retrogradation rate". This rate depends on: the quality of the raw material, the recipe, the applied technology, the packaging method, respectively the storage temperatures.
Old technologies, characterized by high durations of dough fermentation, are based on increasing the diversity of microbial species involved and implicitly on increasing the complexity of the enzymatic system that acts in dough. All this leads to the increase of the dough components hydrophilic properties and to the more uniform gelatinization of the starch granules.
Active compounds are formed in the process of dough stabilization, which act on proteins (organic acids). Lipid hydrolysis compounds contribute to the stabilization of gas bubbles, participating in the formation of micellar structures on their surface [1]. The diversity and quantity of active compounds in the Maillard reactions also increase, resulting in an improved flavor and taste profile. The so-called Chorleywood process (direct, single-phase method) is the basis of the modern bread-making technology. It originates from a series of researches conducted between 1950 and 1962 by the British Baking Industries Research Association, in order to streamline

the technological process of obtaining bread under the use of flours with a lower protein content. The average dough fermentation time of the United Kingdom bakeries was at that time of 2-3 hours. The obtained results allowed the adoption of a technology that has spread throughout the world and which is characterized by: the formation and development of the dough in a single short-term technological operation (max. 5-7 minutes), the use of intensive kneading, the use of an oxidizing agent (initially potassium bromate, currently ascorbic acid), the use of a high melting point emulsifier or fat, additional water amount to control the dough consistency and the addition of at least yeast double amount [3]. From an economic point of view, these modifications allow a significant shortening of the production times (increasing the degree of the production line use) and obtaining a better yield in bread (increasing the amount of dough on account of the additional water). In Romania, the direct method was introduced to the industry in the 1970s, being applied to obtain loaf type bread or bakery products with various additions, which offset the not too good taste generated by the short fermentation times [8].
The duration of a technological cycle, necessary for the preparation of the dough ready to be baked, for a product made after an consecrate recipe, can reach almost 10 hours, while in the case of modern methods, the product can be obtained in one hour (Table 1). Modern bakery technologies are characterized by complex recipes that contain substances that reduce dough resistance (a series of enzymes such as amylases, proteases, xylanases or L-cysteine-reducing agents) or on the contrary, contain substances that enhance the viscous-elastic properties of weak flours (ascorbic acid, enzymes in the category of oxidase-reductases, emulsifiers, lipases etc.) [11]. The kneading technologies are based on cycles of intensive kneading (at high speeds of action of the kneading arms) and working equipment geometries, which allow the mechanical work to be applied to the dough with minimum energy losses. Moreover, it utilize selected microorganisms capable of rapid activation (ie, to rapidly produce the enzymatic equipment necessary for starch degradation and the formation of fermentation gases that will contribute to the increase of bakery products volume). The result is the attainment of optimum properties during the shortest time [10].
Table 1 shows the time required to obtain the dark bread dough, depending on the type of technology used (the baking time was neglected because it depends on the weight of the products and the assortment and does not induce significant differences between technologies) (according to Leonte M., 2008) [6].

Table 1. Time required (min.) for obtaining the black bread dough according to different technologies

Technological procedure	**Romanian consecrated recipes**			**Current recipes**
	Two-phase method with leaven	Two-phase method with fluid leaven	Three-phase method with leaven	Direct method
Sponge kneading	0	0	5-6	0
Sponge fermentation	0	0	300	0
Sourdough kneading	6 - 10	8 -10	7 -10	0
Sourdough fermentation	90 - 135	300 – 360	90 - 200	0
Dough kneading	8 - 12	12 - 14	8 - 12	8 - 12
Dough fermentation (primary or bulk fermentation)	0 -30	25 -30	0 - 20	5 - 12
Dough Rekneading	3 - 8	3 - 8	3 - 8	0 - 3
Proofing	30 - 40	30 - 40	30 - 40	40 - 60
Total time (min)	130 -	378 - 462	443-596	53 - 87

Source: [6].

The technologies on which the Romanian consecrated recipes are based come from a centralized economic system and were not conceived under the pressure of factors that prevail in the current economy, like: factors related to energy efficiency, maximization of capital recovery rates, environmental impact etc. They are attractive from the perspective of the value added to the products from modern technologies and can withstand the market as long as the interest of the consumers for them remains constant, and

they are willing to offer more to buy this kind of products. The Romanian market for bakery products is characterized by one of the highest consumption per capita (70-90 kg/year, depending on various assessments and sources), but also by the lowest prices in relation to the European Union average (Fig. 2) [9].

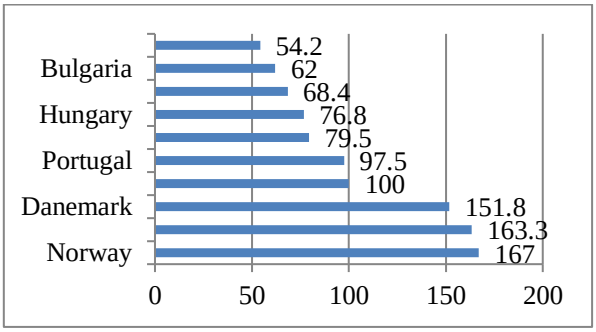

Fig. 2. The deviation of the prices of bakery products in European countries, compared to EU average 28
Source: [9].

A study conducted by GFk Romania in 2018 revealed that 82% of Romanians consume daily 7% less bread than in 2009, when this category of frequent consumers of bread was 89% (Gallup study). Over three quarters of Romanians were buying fresh bread, represented by traditional loaf [2]. At the end of 2019, a number of 33 Romanian consecrated recipes were registered. About 33% of them referred to milk products, 27% to meat products, 27% to bakery products, 9% to fruits and vegetables and the rest to other food products. No milling product is among them, probably due to the fact that milling technologies have not evolved significantly since 1984.

Table 2 presents the names of the certified bakery products, as well as the companies on the market, who have requested consecrated recipes certification.

From the Table 2, it is observed that the commercial companies that have requested the attestation for the consecrated recipes come from less than half of the country counties.

One of these companies, which holds the largest number of certificates, belongs to the Romanian Patronage in the Milling and the Bakery domain (ROMPAN).

The main interest for obtaining the certification was represented by the bakery products with the addition of potatoes, namely: white bread with potatoes (9 certified producers), half-white bread with potatoes and dark bread with potatoes (with 4 certified producers).

Table 2. The names of the Romanian bakery products for which the consecrated recipe certification was requested

Product name	Companies	Geographic area	Year of certification
White bread with potatoes	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	SIMPA S.A	Sibiu	2016
	PÎINEA DE CASĂ S.R.L.	Mureș	2016
	ANA PANIROM GRUP S.R.L.	Arges	2016
	PRODPAN S.R.L.	Tulcea	2016
	TOTH PEK S.RL.	Mures	2017
	TEROCO GEA CONSULT S.R.L.	Prahova	2017
	ALEXPAN S.R.L.	Bihor	2017
	GENICA S.R.L.	Brasov	2018
Half-white bread with potatoes	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	VALYSTON S.R.L	Bacău	2016
	BUNEXIM S.R.L.	Bihor	2017
	ALEXPAN S.R.L.	Bihor	2017
Dark bread with potatoes	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	PRODPAN S.R.L.	Tulcea	2016
	HARMOPAN S.A.	Harghita	2016
	ERPEK S.A.	Covasna	2019
Rye bread	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	TOTH PEK S.RL.	Mures	2017
	R&B COM S.R.L.	Maramures	2019
	LIDAS S.R.L.	Tulcea	2019
Overlaped knitting (Împletiți suprapuși)	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	TRADITIONAL COM S.R.L.	Buzău	2016
	DELICII SIBIENE S.R.L.	Sibiu	2017
București loaf	ROMPAN PROIECT SERVICE S.A.	Bucuresti	2014
	TED INTERNAȚIONAL 2000 S.R.L.	Hunedoara	2015
	ANA PANIROM GRUP S.R.L.	Arges	2016
	EVERY DAY PROD-COM S.R.L.	Suceava	2019
Savarineta	LORENZ FOOD IND S.R.L	Calarasi	2019
Wholemeal bread	LIDO GÎRBEA S.R.L.	Prahova	2019
Wafers - waffles with filling	no data	no data	no data

Source: Own conception.

Two of the products, although they have flour as a raw material, do not belong to the technologies of bread production, respectively the waffles with filling and savarineta

(product obtained by baking a fermented dough obtained from white flour, yeast, standardized liquid or powdered milk, sugar, eggs, oil, salt and water; the savarineta represent the baked dough of the product "savarina"). Also, two of the products that have consecrated recipes belong to the same technological type, namely the loaf products ("Bucureşti loaf" and "Overlaped knitting").

If we understand by technological cluster, a group of products with similar recipes and technologies that can be treated together, from the point of view of process management and compliance verification with a certain standard, the study of standards collections for the milling and bakery industry before 1988, allows the identification of 22 technological clusters, as seen in Table 3.

We note that not all of these products necessarily meet current consumer expectations, for food products without additives and healthy foods. Consecrated recipes do not exclude food additives (lactic, ascorbic, citric, acetic acids, diamalt) or substitutes for certain food products (artificial honey). In addition, certain products no longer meet current legislative requirements, for example: the product "graham bread with honey" refers in its own name to a food ingredient that does not actually contain, respectively natural honey.

Also, in the case of certain products, the names no longer reflect the ingredients corresponding to the current standards and may create confusion for the consumer. For example, the consecrated wholemeal bread recipe provides for the use of an whole flour whose definition in the standards of the time is not clear. Wholemeal bread is consumed since the interwar period and there was at least one official document (a discussion in a meeting of the Council of Ministers of 1942) in which it is mentioned that flour was used to obtain this type of bread with an extraction of at least 85% [4]. At this point, the whole wheat flour involves keeping in its content all the components of the wheat grain (germs, endosperm, outer shells).

Table 3. Technological clusters for old Romanian bakery products

	Cluster	Comments on recipes
1	Graham bread with honey	graham bread, compressed yeast, artificial honey and lactic acid
2	Wheat bread with potatoes	bread made from dark, white, whole wheat flour, with the addition of potato paste, potato flour, rice flour, yeast, water salt and enhancers such as: lactic acid, ascorbic acid, acetic acid, citric or diamalt
3	Hypoglycemic bread for diabetics	obtained from wet gluten with white and half-white wheat flour, wheat bran, yeast, salt, butter and cumin
4	Dietary bread	obtained from wheat flour type 1750, salt, yeast, whey and water
5	Baking products (with or without additions: rolls, buns, braids, sticks, bars, loafs, breads of different shapes and sizes)	Included in this category were a lot of products obtained from white flour, graham flour, type 800 flour, yeast, salt and various additions: sugar, glucose, diamalt, oil, fat, margarine, butter, milk, whey, buttermilk, lecithin, eggs, artificial honey, flavors, poppy, aniseed seeds, ascorbic acid, acetic acid, calcium gluconate, calcium citrate or calcium lactate
6	Wholemeal bread	obtained from whole wheat flour, yeast, salt and water
7	Rye bread	obtained entirely from rye flour type 1200, either from a mixture of rye flour type 1200 and wheat flour type 900, yeast, salt, diamalt and whey
8	Dâmbovița bread	obtained from wheat flour type 800, yeast, salt, water, to which diamalt and enhancers could be added, such as: lactic, ascorbic, citric, acetic acids or lecithin
9	Rye specialty	obtained from dark wheat flour, rye flour, yeast, salt, wheat bran and water
10	Graham specialty	obtained from dark wheat flour, graham flour, yeast, salt, cumin and water
11	Fibropan	obtained from wheat bran, white flour, yeast, salt, pasteurized powdered milk, water and baked in the tray
12	Low-calorie bread	obtained from wheat flour type 1250, protein flour type B from non-degreased corn germs, yeast, salt and water
13	Pandur specialty	obtained from type 900 durum wheat flour, yeast, salt, glucose or diamalt, whey or buttermilk, and water
14	Acloride bread	whole wheat flour, type 800 wheat flour, white flour, yeast, water and ascorbic acid, lactic acid, acetic acid, diamalt and lecithin
15	White bread	the product we currently buy under the generic title of white bread, obtained from white flour type 650, compressed yeast, salt and water; depending on the technological conditions, could be used as enhancers, different organic acids like ascorbic acid, diamond and lecithin
16	Sucevean specialty	obtained from white flour, yeast, salt, sugar, eggs, fats and milk
17	Little loaf dessert with apples	white wheat flour, yeast, salt, sugar, oil, lemon oil and grated apples
18	Vrancean specialty	white wheat flour, B type degreased soybean flour, maize cremogen, yeast, salt, sugar, oil
19	Bread with pre leaven (Galați bread, Danube bread)	white wheat flour, yeast, salt, type B degreased soybean flour, maize cremogen, diamalt, artificial honey, oil, lecithin and lactic bacterial extract
20	Protein bread	obtained from wet gluten, half-white wheat flour, yeast, wheat bran, salt and butter
21	Snagov specialty	white wheat flour type 680, yeast, salt, glucose, vegetable or animal fats, whey or buttermilk, corn cremogen and water
22	Bakery specialties with the addition of bran, wheat germs and wheat pearl barley (Mozaic, Herastrau, Germipan, Wheat)	obtained by baking a fermented dough prepared from white wheat flour, wheat bran, wheat pearl barley, wheat germs, milk, whey or buttermilk, oil, glucose or malt extract, or artificial honey and water

Source: Own conception based on [5].

Accepted losses are of maximum 1-2% as a result of a superficial peeling of the grain, to eliminate microbial or chemical contaminants remaining on the wheat kernel (microorganisms, mycotoxins, heavy metals, pesticides). An extraction of 85% can correspond to modern technologies of a classic flour of type 650-700, at most half-white flour.

However, the old Romanian recipes manage to combine, in a way that is missing from today's recipes, flours or technological products coming from various cereals or leguminous sources: corn flour, soybean flour, germs, rye flour, pearl barley, potato flour, graham flour, bran etc. In the current bakery all these ingredients come from premixes and are not directly managed by the bakers. Therefore, the old recipes have the advantage of the diversity of starch and fiber sources, as well as the use of protein sources that have disappeared in the usual recipes, such as whey and buttermilk.

If we combine the information from Tables 2 and 3 we can see that the products for which certificates have been obtained belong only to 4 of the 22 technological clusters (potato bread, rye bread, wholemeal bread and loaf bakery products).

Basically, only a little over 18% of the old Romanian recipes are currently represented in the range of products made after the consecrated recipes, offered by the Romanian producers. At the basis of this situation are probably both economic and social considerations, from which we list:

-technologies inadequate to the current requirements regarding energy efficiency and capital recovery (longer technological times, higher consumption of labor force, needs for monitoring and control of the technological parameters that involve specialized human resources);

-the lack of interest for the higher capitalization of the milling by-products (germs, bran, corn flower etc.), when the millers are used to deliver these products for animal feed and the bakers to buy them in the form of premixes, generally from the external markets. In the centralized economy, of the planned type, the by-products were scheduled to be part of certain food recipes for human consumption and the quantities that processors had to deliver to the food industry were established in advance;

-a distinction has to be made between nostalgia for food products available sometime and which we associate with certain flavors and tastes and the current expectations of consumers, interested in clean label foods.

No milling product can be found on the list of Romanian consecrated recipes. This is due to the fact that milling products are not the result of recipes, but of processing technologies that have not changed significantly in the last 40 years. The only significant change compared to how milling products were obtained 40 years ago concerns the correction of their milling quality. Basically, current milling products may contain certain amounts of substances with the effect of improving the technological potential, such as: ascorbic acid, cysteine, enzymes, vital gluten and so on.

Before 1984, additives were added exclusively in the bakeries, i.e. their use was conditioned by the destination of the flour in a certain bakery product. Basically, all milling products in which there are no enhancers additions can be considered as cosecrated recipe, in accordance with the legislation promoted by the Ministry of Agriculture.

Table 4. Milling products with potential for recovery in Romanian consecrated recipes

No.	Product name	Description
1	Biovit – flour from wheat germs	obtained by grinding wheat germs previously cleaned and heat treated at 130 140^0 C
2	Corn flour	resulting as a by-product in obtaining cornmeal, it can be used as an additive in various bakery products
3	Calciu gris (calcium semolina)	wheat semolina (99%) and 1% tricalcium phosphate or calcium gluconate
4	Cremogen of wheat or corn	fine white powder with shades of gray, respectively golden yellow, obtained by the expansion of wheat semolina or extra wheatmeal, followed by grinding and sieving; it can be used in the recipes of bakery products, sugary products, instant creams or mayonnaise

Source: Own conception.

However, there are a number of products from the milling industry since then, that can be re-evaluated as consecrated recipes, in the sense that they are characteristic of that era and are

not widely manufactured today. These would contribute to increase of the offers diversity on the market with minimal efforts from industry operators and would allow access to an important source of nutrients for consumers (Table 4).

We consider that, from the information presented here, the use of old recipes and technologies in modern food products can be a significant gain for the consumer. The disintegration of the centralized economic system and implicitly the dissolution of the institutions involved in standardizing the recipes and the norms of manufacturing the Romanian food products, led to the disappearance of the food products on the markets that could contribute to the diversification of the existing offers. Some of the old products of the Romanian milling and bakery industry are now imported or are part of the composition of complex inputs used in the industry, but coming from import.

The benefit of the legislation on food products based on consecrated recipes should not necessarily be a psychological one (the return of the consumer to the flavors and tastes he was once familiar with), because some of these recipes are in contradiction with the modern evolution of consumer behavior, being not “clean label” and containing ingredients that are currently controversial.

CONCLUSIONS

Romania has created a specific legislation whose purpose is to recover old recipes and technologies for the manufacture of certain bakery products. These products are identified as being obtained according to "Romanian consecrated recipes".

5 years after the implementation of the legislation, the number of certified bakery products is quite small, 9 products, of which only 7 can be considered as completely belonging to the bakery industry. Also, the number of producers who hold certificates is very small (21 producers compared to several thousand who operate on the bakery market) placed in less than half of the national territory.

The vast majority of applications for certification are concentrated on bakery products containing additions of potato-derived products.

Only slightly over 18% of the old recipes and technologies are represented in the range of products certified according to the legislation in force.

No milling product is certified, although there are old milling products for which there is no equivalent in products available on the market obtained from current recipes.

The products obtained from consecrated recipes have the quality to contribute to the diversification of the available food resources and to the superior use of some by-products from the industry, but they are not necessarily correlated with the modern trends of the industry in terms of energy efficiency, capital valorization or consumer expectations (no clean label).

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