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16 September 2007

Online at <https://mpra.ub.uni-muenchen.de/25104/>
MPRA Paper No. 25104, posted 19 Sep 2010 15:42 UTC

PAPER PRESENTED:

7th International Conference "Research and Development in Mechanical Industry - RaDMI 2007", Budva, Montenegro, 16-20. September 2007.

PAPER PUBLISHED:

Conference proceedings Edited by Predrag Dašić. Krusevac: Institute IMK "14. October" and Trstenik: High Technical Mechanical School, 2007, pp. 358-362. ISBN 86-83803-22-4.

STRATEGIC CONCERNS ABOUT TECHNOLOGICAL RESEARCH OF THE ROMANIAN BAKING AND FLOUR PRODUCTS INDUSTRY

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Abstract:

Taking into account the economic and social importance of research-development activities as far as the technologies and the political measures are concerned, in the context of food security and of population's food and nourishment, the necessity for developing a strategy and research-development activities in the field is obvious¹.

The research-development activities in the milling and baking industry focus on processing the agricultural resources (wheat, rye, corn etc.) with a view to making bakery products.

The research-development activities in this field cover the totality of the processes in terms of technological-biotechnological-technical-economic aspects, ensuring the basic and industrial processing of the bakery products, the integrated specific biotechnologies and all the services which integrate the supply-demand relations on the bakery products market in the context of the population's food-related behavior.

Key words: strategy, technological research, baking industry, public policies

INTRODUCTION

IN THE CONTEXT OF EUROPEAN INTEGRATION AND OF THE ECONOMY GOING GLOBAL, THE MAIN ISSUE IS COMPETITIVENESS, WHICH DEPENDS ON THE CAPACITY OF SECTORS TO INNOVATE. THE ROMANIAN AGRICULTURAL PRODUCTION BECOMES COMPETITIVE ONLY IF THERE IS COMPETITIVE RESEARCH IN THE FIELD. THE FACT THAT WE ARE TOTALLY DEPENDENT ON IMPORTED SOLUTIONS KEEPS US BEHIND OUR COMPETITORS AND HINDERS ROMANIA FROM GAINING A STABLE ROLE ON THE EUROPEAN AND INTERNATIONAL MARKET.

THE COMPETITIVENESS OF CEREAL PRODUCTION IN ROMANIA DEPENDS ON FINDING OPTIMAL SOLUTIONS REGARDING THE EFFECTIVE USE OF NATURAL CONDITIONS, THAT IS CLIMATE AND SOIL, OF HUMAN RESOURCES, OF THE BIOLOGICAL AND TECHNOLOGICAL ONES AND OF MATERIAL AND FINANCIAL RESOURCES. ON THE OTHER HAND, IT IS ABOUT MAKING GOOD USE OF THE CHANCES THAT EMERGE FROM THE EVOLUTION OF THE DOMESTIC AND INTERNATIONAL MARKET.

◆ CEREAL PRODUCTS REPRESENT THE MOST IMPORTANT FOOD PRODUCTS FOR PEOPLE. APPROXIMATELY 55% OF PROTEINS, 15% OF LIPIDS AND 70% OF GLUCIDES, THAT IS A TOTAL OF 50 – 55% OF THE CALORIES CONSUMED ALL OVER THE WORLD, COME FROM CEREAL PRODUCTS. AMONG THESE, WHEAT, RICE AND CORN ARE THE MOST IMPORTANT ONES. WHEAT BREAD MOST ECONOMICALLY MEETS THE HUMAN BEINGS' NEEDS IN TERMS OF NUTRITIVE AND ACTIVE PRINCIPLES. WHEAT CONTAINS A GREAT AMOUNT OF PROTEINS (7 – 22%), WHICH ARE

¹ Godet M., „Manuel de prospective stratégique”, vol.II (L'art et la méthode), 2^e édition, Dunod, Paris, 2001, p.67-71

REPRESENTED BY PROLAMINES (35 – 45%), GLUTENINS (35 – 40%), GLOBULINS (15 – 20%) AND ALBUMIN (2 – 5%). THEY ENSURE THE HUMAN BODY'S GROWTH AND DEVELOPMENT AND PLAY A VERY IMPORTANT BIOCATALYTIC AND ENERGETIC ROLE. WHEAT AND BREAD HAVE AN ENERGETIC ROLE, GRAINS AND WHEAT FLOUR CONTAIN MANY B VITAMINS: VITAMIN B1 (0,5 – 0,8 MG%), VITAMIN B2 (0,2 – 0,4 MG%), VITAMIN B5 (3-5 MG%), B6 VITAMIN (3 – 6 MG%), PP VITAMIN (2 – 5 MG%). WHEAT CONTAINS ALMOST THE ENTIRE RANGE OF ESSENTIAL AMINO ACIDS. BESIDES BREAD AND OTHER BAKERY PRODUCTS, WHEAT IS ALSO USED IN PRODUCING FLOUR PASTE WARE, ALCOHOL, STARCH AND GLUCOSE. IN TERMS OF HUMAN NUTRITION, THE UNIQUE POSITION OF WHEAT AMONG OTHER GRAINS IS DUE TO THE QUALITY OF THE DOUGH MADE OF WHEAT FLOUR TO RETAIN CARBON DIOXIDE PRODUCED BY YEAST THROUGH FERMENTATION. TAKING INTO ACCOUNT ALL THESE ASPECTS, IT IS OBVIOUS THAT THE WHEAT FLOUR HAS BECOME A VERY IMPORTANT FOOD PRODUCT FOR PEOPLE. WHEAT IS CULTIVATED IN OVER 45 COUNTRIES AND FEEDS 35 – 40 % OF THE EARTH'S POPULATION².

ASPECTS REGARDING THE STRATEGIES IN THE TECHNOLOGICAL RESEARCH IN THE ROMANIAN BAKING INDUSTRY

CEREAL – BASED PRODUCTS, SUCH AS BREAD, BISCUITS, FLOUR PASTE WARE AND OTHER PASTRY PRODUCTS ARE DAILY CONSUMED BY MOST PEOPLE. ALL NUTRITIONAL GUIDES RECOMMEND DAILY CONSUMPTION OF CEREAL. MOREOVER, A BIGGER CONSUMPTION IS REFERRED TO AS A HEALTHY LIFE STYLE.

THE CURRENT METHODS OF PRODUCING BREAD RELY ON INTENSIFYING THE DOUGH PREPARATION AND FERMENTATION, WHICH LED TO OBTAINING BAKERY PRODUCTS WITH DIMINISHED SENSORIAL CHARACTERISTICS AS REGARDS TASTE, FLAVOUR AND THE POSSIBILITY TO MAINTAIN THE BREAD FRESH FOR A CERTAIN PERIOD OF TIME. THESE CHARACTERISTICS CAN BE IMPROVED BY APPLYING A TECHNOLOGY FOR BREAD MAKING THAT INVOLVES A STAGE OF FERMENTING A LIQUID SOLUTION, BASED ON WHEAT FLOUR, TO WHICH FERMENTABLE SUBSTANCES, ENZYMES, MINERAL SALTS, AND BAKERY YEAST IN A PROPORTION MEANT TO ENSURE THE YEASTS' CAPACITY TO FERMENT THE DOUGH THROUGHOUT THE ENTIRE CYCLE OF BREAD MAKING.

- THE PREFERMENT – BASED BREAD MAKING IS CURRENTLY USED, GIVEN THE FACT THAT THE BREAD FLAVOUR IS SCARCE BECAUSE OF THE TECHNOLOGICAL PROCESSES THAT INVOLVE DIRECT METHODS OF PRODUCING BREAD, WITH REDUCED PERIODS OF FERMENTATION. AS A CONSEQUENCE, THE QUALITATIVE EVALUATION OF BREAD IS MADE IN ACCORDANCE WITH THE CHARACTERISTICS OF VOLUME INCREASE, WHICH ARE MEANT TO MEET THE CONSUMERS' DEMANDS. THE FACT THAT A LOAF OF BREAD HAS A SATISFACTORY SIZE DOESN'T MEAN THAT IT MEETS THE REQUESTS REGARDING THE TASTE AND THE FLAVOUR, WHICH THE BREAD HAS TO MAINTAIN AS LONG AS POSSIBLE. THESE REQUESTS ARE FULFILLED THROUGH A LONG TECHNOLOGICAL PROCESS OF DOUGH FERMENTATION, IN SPECIFIC CONDITIONS OF TEMPERATURE AND DOUGH CONSISTENCE OR THROUGH A PREFERMENT TECHNOLOGICAL PROCESS, IN WHICH THE MAIN STAGE OF FERMENTATION IS REPLACED BY AN INTERMEDIARY PHASE. DURING THIS PHASE THE YEASTS DEVELOP AND MULTIPLY IN A SUBSTANCE MADE OF WHEAT FLOUR, TO WHICH A SOURCE OF FERMENTABLE SUBSTANCES IS ADDED, WHICH RESULTS IN CARBON DIOXIDE, ETHYLIC ALCOHOL AND AN ENTIRE SERIES OF FLAVOURED SUBSTANCES THAT MAKE THEIR CONTRIBUTION TO THE BREAD'S TASTE AND FLAVOUR. THIS INTERMEDIARY PHASE CAN BE INTRODUCED IN THE CLASSICAL FERMENTATION PROCESSES OF THE DOUGH IN ORDER TO PREPARE LEAVEN OR DIRECTLY INTO THE DOUGH WHEN THE DIRECT PROCESS IS USED. SINCE FERMENTATION REPRESENT THE LONGEST PHASE IN THE TECHNOLOGICAL PROCESS OF BREAD MAKING, THE NEW PROCEDURES AIM MAINLY AT IMPROVING THE FERMENTATION CONDITIONS AND AT REDUCING ITS LENGTH BY MAKING USE OF SPECIFIC MICRO-ORGANISMS WITH HIGH FERMENTATIVE ACTION SUCH AS LIQUID YEASTS, PREFERMENTS AND FLUID LEAVEN. THERE ARE VARIOUS TECHNOLOGICAL SCHEMES SPECIFIC TO EACH COUNTRY THAT USE PREFERMENTS, IN BOTH CASES: WHEN THEY APPLY THE METHOD BASED ON LEAVEN, ESPECIALLY LIQUID LEAVEN OR WHEN THEY USE THE DIRECT PROCEDURE. THE BREAD IS SUPERIOR TO THAT MADE WITH COMPRESSED YEAST.

BEING FAMILIAR WITH THE TECHNOLOGICAL SCHEMES AND PROCESSES CURRENTLY APPLIED WORLDWIDE, THE BIGGEST PRODUCERS IN THE ROMANIAN BAKING INDUSTRY HAVE ALSO INTRODUCED THE PREFERMENT PROCEDURE IN BREAD MAKING. WHEN APPLYING THIS PROCEDURE, THE EXISTING TECHNOLOGICAL EQUIPMENT AND LINES, THE QUALITY OF THE RAW MATERIAL (THE FLOUR) AND THE NATIONAL SPECIFIC REGARDING THE TASTE OF THE BREAD HAVE TO BE TAKEN INTO ACCOUNT. FOR INSTANCE, IN THE US THERE ARE PROCEDURES FOR PREFERMENT PREPARATION THAT DO NOT INCLUDE WHEAT FLOUR (THEY INCLUDE WATER, YEAST, SUGAR, MILK, SALT AND NUTRITIVE SUBSTANCE FOR YEAST) AND PROCEDURES IN WHICH THE PREFERMENT IS PREPARED USING 10 – 20% FLOUR OF THE TOTAL AMOUNT.

² Giurcă V, Giurea A. M., „Factors that influence the wheat baking properties”, AGIR Publishing House, Bucharest, 2002, p. 3 – 11.

IN RUSSIA AND IN OTHER EASTERN EUROPEAN COUNTRIES, THE PREFERMENT AND THE LIQUID YEASTS ARE PREPARED BY USING A CULTURAL MEDIUM FERMENTED WITH ACID-LACTIC BACTERIA.

THE PREFERMENT – BASED PROCEDURE USED IN BREAD MAKING IMPROVES THE BREAD’S SENSORIAL CHARACTERISTICS IN TERMS OF FLAVOUR AND TASTE AND THE PHYSICAL AND CHEMICAL ONES IN TERMS OF VOLUME INCREASE, CRUMB’S POROSITY AND ELASTICITY. IT ALSO MAINTAINS THE BREAD FRESH FOR A PERIOD OF TIME AND IT PREVENTS IT FROM GETTING BACILLUS MESPENTERICUS.³

• NOWADAYS BAKERY PRODUCTS CONSUMERS ARE BECOMING MORE AND MORE AWARE OF THE HYGIENE – RELATED ASPECTS OF THE MARKET AND FOOD. IN ORDER FOR THESE PRODUCTS TO BE SAFELY CONSUMED, THEY HAVE TO RESPECT BOTH THE TECHNOLOGICAL AND THE HEALTH EXIGENCIES.

THE MAIN STRATEGIC OBJECTIVES IN THIS FIELD AIM TO: IMPROVE THE PRODUCTS’ ASPECT AND STRUCTURE, INCREASE THEIR NUTRITIVE VALUE, OFFER THE CONSUMERS PRODUCTS AS NATURAL AS POSSIBLE AND WITH A POSITIVE INFLUENCE ON THEIR HEALTH, DIVERSIFY THE RANGE OF DIETETIC PRODUCTS BY USING ALL THE COMPONENTS OF THE WHEAT GRAIN, WHICH ARE RICH IN VITAMINS, MINERALS AND FIBRES, DIVERSIFY THE RANGE OF PRODUCTS DESTINED TO CHILDREN AND YOUNG PEOPLE, INCLUDE TRADITIONAL AND ENVIRONMENTALLY FRIENDLY PRODUCTS.

• THE CONSUMER’S CURRENT TENDENCY TOWARDS NATURAL PRODUCT LEADS THE PRODUCERS OF BAKERY PRODUCTS TO MARKET PHILOSOPHY BASED ON MAKING LOW-FAT PRODUCTS. AS A CONSEQUENCE, IMPORTANT PROGRESS HAS BEEN MADE LATELY AS REGARDS THE WAYS OF USING SOY IN MAKING BREAD AND FLOUR PRODUCTS. BY ADDING SOY FLOUR, THE NUTRITIVE VALUE OF THE PRODUCT IS INCREASED, ITS QUALITY IS IMPROVED AND THE COSTS ARE REDUCED. IN THE UNITED STATES OF AMERICA, THE BAKERS ARE PERSUADED TO ADD SOY FLOUR BY BEING TOLD THAT THIS WAY “A SUPERIOR PRODUCT WITH REDUCED COSTS IS CREATED”.

AS REGARDS BREAD MAKING, 3% FAT-FREE SOY IS USED OUT OF THE TOTAL AMOUNT OF FLOUR. A 1-3% ADDITION OF FAT-FREE SOY IN MAKING BREAD AND ROLLS LEADS TO AN INCREASE IN THE HYDRATION CAPACITY (FOR EACH 500 GRAMS OF USED SOY AN EXTRA 500-750 ML WATER AMOUNT IS ADDED), AN AMELIORATION OF THE CRUMB’S STRUCTURE AND ELASTICITY, AN IMPROVEMENT OF THE CRUST’S COLOUR DUE TO THE SUGARS CONTENT.

THERE ARE SEVERAL ADVANTAGES OF USING FAT-FREE SOY IN BREAD MAKING: IT INCREASES THE CAPACITY OF PRESERVING THE WATER CONTENT; IT PREVENTS THE LOSS OF WATER DURING THE BAKING PROCESS; IT INCREASES BREAD NUTRITIVE VALUE; IT IMPROVES BREAD QUALITY; IT REDUCES PRODUCTION COSTS.

THE ECONOMIC ADVANTAGE RESULTED FROM USING FAT-FREE SOY IS PRESENTED IN TABLE 1.

TABLE 1. THE ECONOMIC ADVANTAGE RESULTED FROM USING SOY FLOUR

RAW MATERIALS	THE STANDARD	BREAD MADE WITH AN ADDITION OF 3% SOY FLOUR
WHEAT FLOUR	100 KG	100 KG
SOY FLOUR	-	3 KG
WATER	60 KG	64,5 KG
SALT	1,5 KG	1,5 KG
YEAST	4 KG	4 KG
AMELIORATORS	0,5 KG	0,5 KG
DOUGH WEIGHT	166 KG	173,5 KG
THE WEIGHT OF THE PIECE OF DOUGH	0,236 KG	0,231 KG
THE WEIGHT OF THE LOAF OF BREAD BAKED	0,200 KG	0,200 KG
THE NUMBER OF THE LOAVES OBTAINED FROM THE DOUGH	703 LOAVES	751 LOAVES

SOURCE:***USING SOY FLOUR IN MAKING BAKERY AND FLOUR PRODUCTS, ROMPAN, BUCHAREST, 2003, P.5-6

THE CONCLUSION IS THAT IF 3 KG OF SOY FLOUR ARE ADDED TO THE DOUGH MADE OF 100 KG OF WHEAT FLOUR, AN EXTRA NUMBER OF 48 LOAVES OF BREAD IS OBTAINED.

DEPENDING ON ITS TYPE AND CHEMICAL COMPOSITION, THE SOY FLOUR USED IN BREAD MAKING CAN HAVE SEVERAL FUNCTIONS: TO STRENGTHEN THE PROTEINS AND GLUTEN; TO INCREASE THE RESISTANCE TO KNEADING AND TO POSTPONE THE EXPIRY DATE OF THE BREAD; TO OBTAIN DOUGH WITH ENZYMATIC PROPERTIES; CRUNCHY PROPERTIES FOR THE FINAL PRODUCT; GOOD TASTE – SIMILAR TO THE NUTS’.

THE IMPORTANCE OF THIS PHENOMENON TO THE ORIENTATION OF THE STRATEGIES APPLIED BY THE FIRMS IN THE BAKING INDUSTRY LED TO EQUIPPING THEIR LABS WITH MODERN DEVICES MEANT TO IDENTIFY THE

³ Voicu, A., „Preliminary research regarding preferment-based bread making”, in „News from the milling and baking industry”, no. 2/2003, p. 1-10.

COMPOSITION OF THE BAKERY PRODUCTS. IT ALSO LED TO DIVERSIFYING THE PRODUCTS AND TO IMPROVING THEIR QUALITY.

- THE SOY FLOUR CAN ALSO BE USED IN MAKING PASTRY PRODUCTS, CAKES, WAFERS, BISCUITS AND FLOUR PASTE WARE. IN THE LAST TEN YEARS, MANY STUDIES REGARDING THE USE OF SOY FLOUR FOR BAKERY PRODUCTS HAVE BEEN MADE. COMBINING THE PROTEINS IN THE WHEAT FLOUR AND THOSE IN THE SOY FLOUR LEADS TO A BETTER BALANCE OF THE AMINO ACIDS AND INCREASES THE QUANTITY OF REAL PROTEINS. THE SOY-BASED PRODUCTS ARE RELATIVELY RICH IN ISOFLAVONES, IN A PROPORTION OF 2-4MG/GRAM. AMONG THESE ISOFLAVONES, ESPECIALLY DAIDZEIN AND GENISTEIN, COMPONENTS WITH A SLIGHT ESTROGENIC ACTION, 1000 TIMES LESS POWERFUL THAN THAT OF THE NATURAL ESTROGENS. PARTIAL REPLACEMENT OF ANIMAL PROTEINS WITH SOY PROTEINS LEADS TO DECREASING THE LEVEL OF CHOLESTEROL IN BLOOD, ESPECIALLY IN THE CASE OF PERSONS WITH A CHOLESTEROL LEVEL OF ABOVE 240 MG/DL. SINCE THE HIGH VALUES OF CHOLESTEROL ARE ASSOCIATED WITH CARDIOVASCULAR DISEASES, THE IMPORTANCE OF CHOLESTEROL REDUCTION IS OBVIOUS, ESPECIALLY LDL, THAT IS LIPIDS WITH SMALL MOLECULAR MASS. PROTEINS AND ISOFLAVONES IN THE SOY-BASED PRODUCTS DIMINISH OSTEOPOROSIS, WHICH MEANS THAT THE BONES SYSTEM RESISTANCE IS WEAKENED AND DETERIORATED, ESPECIALLY WITH THE OLD PEOPLE⁴.

- MAKING AND SELLING BAKERY PRODUCTS REPRESENT DOMAINS OF GREAT IMPORTANCE FOR THE CITIZENS' HEALTH AND INTEREST PROTECTION. THE PUBLIC AUTHORITIES ARE RESPONSIBLE FOR THE CITIZENS' SAFETY THROUGH ELABORATING A LEGISLATION REGARDING THE WAY THEY ARE PRODUCED AND SOLD. THE LEGISLATION HAS TO REFER TO SAFETY IN ORDER TO GUARANTEE THEIR QUALITY IN ACCORDANCE WITH THE SPECIFIC REQUIREMENTS, BEFORE THEY ARE ON THE MARKET.

THE SCIENTIFIC RESEARCH IN THE BAKING INDUSTRY, THE STRATEGIES ADOPTED BY THE MAIN PRODUCERS AND DISTRIBUTORS ARE MAINLY ORIENTED TOWARDS FINDING SOLUTIONS TO REDUCE THE LENGTH OF THE TECHNOLOGICAL PROCESS, TO IMPROVE PRODUCTION QUALITY, TO POSTPONE THE PRODUCTS' EXPIRY DATE AND, FINALLY, TO INCREASE FOOD SAFETY. THE RESEARCH RESULTS CONSIST OF METHODS THAT CAN BE USED TO ACCELERATE THE FLOUR MATURATION, A PROCESS THAT NEEDS TIME AND SPACE IN ORDER TO REPLACE THE CLASSICAL, SLOW KNEADING WITH INTENSIVE AND RAPID KNEADING, WITH A VIEW TO CONSIDERABLY REDUCING THE TIME OF DOUGH FERMENTATION OR EVEN EXCLUDING IT AND, AT THE SAME TIME, INCREASING BREAD QUALITY⁵. FLOUR MATURATION IS A COMPLEX BIOPHYSICAL PROCESS, WHICH SLOWLY TAKES PLACE IN THE FLOUR AFTER THAT WHEAT GRAINS HAVE BEEN GROUND AND WHICH LEADS TO THE AMELIORATION ITS BAKING CHARACTERISTICS. THE FLOUR FRESHLY GROUND FORMS A STICKY, RIGID DOUGH, WITH REDUCED CAPACITY TO ABSORB THE WATER, WHICH MAY DECREASE AT THE FINAL LEAVEN, AND THE LOAF OF BREAD HAS A REDUCED SIZE, DENSE CRUMB AND CRACKED CRUST⁶.

THE MATURATION PROCESS CONSISTS OF COMPLEX AND INTERDEPENDENT PHENOMENA WHICH TAKE PLACE IN THE WHEAT FLOURS AFTER MILLING, INFLUENCED BY NUMEROUS PHYSICAL, CHEMICAL AND BIOCHEMICAL FACTORS THAT MAY PRODUCE, INTERACTIVELY, CHANGES THAT LEAD TO GREAT TRANSFORMATIONS OF THEIR CHARACTERISTICS, ESPECIALLY IN THE CASE OF FLOURS WITH WEAK OR MEDIUM POWER. THE MAIN CHANGES IN THE WHEAT FLOUR AFTER MILLING, WHICH TAKES PLACE IN THE MATURATION PERIOD, ARE:

- STANDARDIZATION OF THE WHEAT HUMIDITY ACCORDING TO THE PARAMETERS OF THE ENVIRONMENT, REACHING A BALANCE;
- BIOCHEMICAL MODIFICATION OF THE MAIN FLOUR COMPONENTS (GLUCIDS, LIPIDS, PROTIDS), AND ACIDITY INCREASE AS A CONSEQUENCE OF THE RELEASE OF FAT ACIDS UNDER THE ACTION OF LIPASE AND THE IMPROVEMENT OF THE TECHNOLOGICAL CHARACTERISTICS OF THE PROTEINS WHICH FORM GLUTEN;
- CHEMICAL, ENZYMATIC OXIDATION OF THE ESSENTIAL FAT ACIDS, OF THE CAROTENOID PIGMENTS, WHICH DETERMINES THE FLOUR WHITENING AND THE AMELIORATION OF THE REOLOGICAL PROPERTIES OF THE GLUTEN. THE IMPROVEMENT OF THE REOLOGICAL PROPERTIES OF THE GLUTEN REPRESENTS, FOR THE SPECIALISTS, THE ESSENCE OF THE MATURATION PROCESS.

ANOTHER STRATEGIC CONCERN WITH A GREAT IMPORTANCE TO IMPROVING THE QUALITY OF BAKERY PRODUCTS REFERS TO EXTENDING THE USE OF COLDNESS IN BAKERY BOTH AS A METHOD OF PRESERVATION AND AS A TECHNOLOGY TO MAKE BREAD BY USING REFRIGERATED OR FROZEN DOUGH. REFRIGERATION, AS A PROCESS, CONSISTS OF COOLING THE PRODUCTS DOWN TO TEMPERATURES AROUND THE FREEZING POINT, WITHOUT GETTING ICE IN THE PRODUCT. THE TECHNOLOGY OF PRODUCING BREAD THROUGH REFRIGERATION IS BASED ON SLOWING DOWN THE BIOCHEMICAL AND MICROBIOLOGICAL PROCESSES AS A RESULT OF TEMPERATURE DECREASE. THIS

⁴ Leonte M., „The soy in the baking industry ” in „The Baker”, January 2004, p. 20-22, March 2004, p. 20-21.

⁵ ***”Détail des facteurs: process – la fermentation”, *Les Nouvelles de la Boulangerie Pâtisserie, Supplement technique*, nr.83/2003, I.N.B.P, p.10-12.

⁶ Bordei D., Teodorescu F., Toma M., „The Science and Technology of Bakery”, Agir Publishing House, Bucharest, 2000.

TECHNOLOGY INVOLVES THE REFRIGERATION OF LEAVEN IN BULK AND OF THE PIECES OF DOUGH MODELLED AND PARTIALLY LEAVENED. THE TECHNOLOGY CONSISTS OF TWO STAGES: COOLING AND REHEATING. THE SEMI-PRODUCTS – LEAVEN OR DOUGH - ARE COOLED DOWN TO 2 – 10 DEGREES CELSIUS⁷.

THE DEVELOPMENT OF PRODUCTION AND CONSUMPTION OF BAKERY PRODUCTS HAS LED, IN MOST OF THE COMPANIES, TO A CHANGE IN CONCEIVING OF THE USED TECHNOLOGICAL PROCESSES; THE AIM IS TO MOVE FROM THE CLASSICAL TECHNOLOGY TO THE TECHNOLOGY BASED ON FROZEN DOUGH. THE NEW TECHNOLOGY ALLOWS THE PROCESSING OF THE PRODUCTION PEAKS, THUS ENSURING ITS FLUENCY, AS WELL AS THE POSSIBILITY TO SELL THE PRODUCTS IN THE PLACE WHERE THEY ARE PRODUCED. ALTHOUGH THE FROZEN DOUGH-BASED PRODUCTS COST MORE, THEY CAN BE BETTER SOLD DUE TO THEIR FRESHNESS AND TO THE POSSIBILITY FOR THE CONSUMERS TO WATCH THE MAKING PROCESS.

THE QUALITY OF THE BREAD, WHICH IS OBTAINED THROUGH THE TECHNOLOGY OF FROZEN DOUGH, HAS, IN GENERAL, A SMALLER VOLUME THAN THE ONE TRADITIONALLY OBTAINED. IN ORDER TO REDUCE THIS DRAWBACK IT IS NECESSARY TO USE THE FLOUR OF APPROPRIATE QUALITY, TO INCREASE THE AMOUNT OF YEAST USED AND TO INTRODUCE IT TOWARDS THE END OF THE KNEADING PROCESS, WHICH HAS TO BE MADE INTENSIVELY AND AT LOW TEMPERATURES. IN THE TECHNOLOGY OF MAKING FROZEN DOUGH-BASED BREAD THE SPECIALISTS CONSIDER THAT THE UNDIVIDED DOUGH'S FREEZING IS NOT RATIONAL BECAUSE BOTH THE FREEZING AND THE DEFREEZING NEED A LONG TIME TO TAKE PLACE⁸.

A STRATEGIC ORIENTATION OF THE BIG PRODUCERS AND DISTRIBUTORS OF BAKERY PRODUCTS IS ALSO THE CONCERN TO PRESERVE THESE PRODUCTS AS LONG AS POSSIBLE, IN WHICH THEY ARE SUPPOSED TO MAINTAIN THEIR INITIAL CHARACTERISTICS, AND TO ENSURE A BETTER FOOD SAFETY BY USING MODERN PACKAGING TECHNOLOGIES. IT'S ABOUT PACKING BREAD AND BAKERY PRODUCTS USING TECHNOLOGIES SUCH AS: VACUUM PACKAGING (VP), CONTROLLED-ATMOSPHERE PACKAGING (CAP), MODIFIED-ATMOSPHERE PACKAGING (MAP), WHICH ARE FUNDAMENTAL STRATEGIES FOR THE ROMANIAN COMPANIES. AMONG THESE TECHNOLOGIES, THE SPECIALISTS THINK THAT MODIFIED-ATMOSPHERE PACKAGING BEST MEETS THE CONSUMERS' DEMANDS TO HAVE A NOT DEFORMED, LOOKING FRESH PRODUCT, WITH NO CHEMICAL ADDITIVES AND EASY TO USE. THE MODIFIED-ATMOSPHERE PACKAGING TECHNIQUE IS MOST FREQUENTLY USED BY PRODUCERS AND DISTRIBUTORS OF BAKERY PRODUCTS IN ROMANIA AND THIS INVOLVES THE REPLACEMENT, IN THE PACKAGING PROCESS, OF THE AIR CONTAINED BY THE PACKAGE WITH A GAS OR A MIXTURE OF GASES. THE PRODUCT IS HERMETICALLY CLOSED IN THIS MEDIUM. THE PACKAGES USED ARE GAS PROOF IN ORDER TO AVOID THE GAS EXCHANGE WITH THE ATMOSPHERE THROUGHOUT THE WHOLE PERIOD OF PRESERVATION⁹.

AS A CONCLUSION, WE CAN SAY THAT THE MAIN STRATEGIC ORIENTATIONS OF THE COMPANIES THAT PRODUCE AND DISTRIBUTE BAKERY PRODUCTS IN ROMANIA AIM TO MEET THE QUALITY REQUIREMENTS IMPOSED BY THE EUROPEAN UNION AND TO SUCCESSFULLY FACE THE COMPETITION ON THE GLOBALISED MARKET.

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⁷ Bordei D., Teodorescu F., Toma M., „*The Science and Technology of Bakery*”, Agir Publishing House, Bucharest, 2000, p. 130-132.

⁸ Niederauer Th., „*Ergebnisse der Brotaromaforschung*”, *Die Mühle*, nr.41, p.706-707, 1991

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