

ABSTRACT AND REFERENCES

*Nutriciology, dietetics, problems of nutrition***MOUSSE TECHNOLOGY WITH APPLICATION OF DIETARY SUPPLEMENTS OF JUNIOR ATHLETES** (P 3 - 6)

Mihail Peresichnyi, Oksana Bondar

In the conditions of modern sports development, the arrangement of balanced nutrition of sportsmen plays an important role. High level of physical, neurological and psychological stress, which develops in the course of trainings and competitions, is accompanied by essential rearrangement of metabolic processes leading to the sportsmen's increased need in energy and food nutrients. This said, nutrition plays a vital role in supporting a high level of functionality of the body and quickening the adaptive processes to intensive muscle activity. Besides, the selection of the dietary pattern and amount of food consumed in line with the energy expenditure of the body are crucial.

Lately, studying and balanced remodeling of sportsmen nutrition have become quite urgent, given that the correct solution of these problems support the health and vital functions of the body.

The purpose of this work is to develop and examine a chemical composition of desserts with dietary supplements for functional nutrition of sportsmen, namely: the roots of *Glycyrrhiza glabra*, *Potentilla erecta* and *Panax ginseng*, plus the impact of minor substances, the dietary supplements used, on different functions of sportsmen's bodies, i.e. junior athletes. The data received as a result of experimental research proved the essential role of main and essential nutrients in nutrition of junior athletes. It was proven that consumption of such desserts improved the resistance of body to intense stress, increased the motor response and generally enhanced the working ability, which is of vital importance for training of junior athletes in the period of competitions and in the renewal process.

Key words: dietary supplements, nutrition athletes, dessert dishes, amino-acid score

References

1. Pokrovsky, A.A. (1975). *Recomendazyy po pitannyi sportsmenov*. M.: PhiC-170 p.
2. Pokrovsky, A.A. (1976). *Pitanye I sport*. M.:- 48 p.
3. Korovnikov, K.A., Bohdanov, N.H., Yalovaya, N.I. i dr. (1986). *Sbornyk nauchnyh trydov Instituta pitanya RAMN Teoreticheskie I klinicheskiye aspekty nayki I pitanya.*, M., VII, 315-320.
4. Korovnikov, K.A., Yalovaya, N.I., Azizbekyan, H.A. i dr. (1984). *Ezhegodnyk Tyazholaya atletica*. M.: PhiC, 63-66.

5. ADA Reports. Position of the American Dietetic Association, Dietitians of Canada. and American College of Sports Medicine: nutrition and athletic performance (2000). *J. Am. Diet Assoc.*, 1000, 1543-1556.
6. Holberh, N.D., Dondukovskaya, R.R., Danilova, M.A. i dr. (2008). *Teor. i pract. phiz. Kult*, 3, 73-81.
7. Jacob, W., Gabriel, J. (2006). *Int. soc. Sports Nutr.*, 1, P. 7-27.
8. Kevin, D., Tipton, K.D. (2001). *CJAP.*, 6, 24-28.
9. Jay, R.H., Nicolas, A., Ratamess, Jie K. et al. (2006). *J. Int. Soc. Sports Nutr.*, 3, 2, 12-18.
10. Chen J. Vitamins: Effect of Exercise on Requirements (2000). *Nutrition in Sport* / Ed. R.M. Maughan. - Blackwell Science., 281-291.

MINERAL COMPOSITION OF CHEESCAKES WITH RAW PLANT MATERIALS (P 6 - 9)

Mihai Peresichnyi, Svitlana Peresichna, Natalya Rozumna

In the recent years, the dietary imbalance of Ukrainians related to the contents of essential substances has been one of the factors of emergence of such diseases as diabetes mellitus and obesity.

It should be noted that the products consumed by the people are usually high in calories, which is mainly caused by the abundance of simple carbohydrates and fats against low contents of dietary fibre, minerals and vitamins.

The technology of deserts production is based on increased contents of minerals due to the raw plant materials at the level of 10...40 % of a daily average need of the adult population.

The suggested method of cheesecake production with the use of raw plant materials enhances the nutritional value and increases the contents of macro- and microelements. The percentage of the daily need satisfied by consumption of 100 g of developed products is: incalcium-10 to 14 %, iodine - 40 to 60 %, magnesium - 23 to 29 %, iron - 25 to 45 %, zinc - 34 to 46 %, phosphorus -10 to 15 %, potassium - 9 to 18 % due to the use of different types of cereals, raw vegetable and fruit materials.

It was proven that eating the developed cheesecakes satisfies 10-40 % of the daily need in the majority of minerals according to the recommended nutritional standards for population.

Keywords: cheesecake, technology, plant material, minerals.

References

1. Prentice, A.M., Jebb, S.A. (2004). Energy intake/physical activity interactions in the

- homeostasis of body weight regulation. *Nutrition Reviews*, 62, P, 98-104.
2. Proekt Zakony Ukraine "Pro zatverdzhennia Zagalnjderzhavnoi programy "Zdorovia – 2020: ukrainsri vymir"
 3. Pogorelov, M.V., Buymestrov, V.I., ta in (2010). Makro- ta microelementy (obmin, patalogiia, ta metody vyznachennia) : monog. Sumy : Vyd-vo. SumDU, 147 p.
 4. Haryscharyshvyly, I.Z., Horhoshydz, B.E. (2006). Analiz mikroelementnogo sostava volos rentenofluorestsentem metodomi ego znacheniia v dele diagnosniri zabolivaniy cheloveka. *Ekspermentalnaia i klinicheskaai medezyna*, 7, 65–67.
 5. Karpenko, P.O., Peresichna, S.M., Gryshenko, I.M., Melnychuk N.A. (2011). Osnovy razionalnogo i likuvalnogo charchuvannaia: [navch. posib.]. K.: Kyiv. nats. torg.-ekonom. un-t, 504 p.
 6. Mazaraki, A.A., Peresichnyy, M.I., Kravchenko, M.F. (2012). Tehnologiiia harchjvyx produktyv xarchuvannia funktsionalnogo pryznachennia: monografiia. 2-ge ved., pereroblene. i dopov. K. : Kyiv. nats. torg.-ekonom. un-t, 1116 p.
 7. Matkovic, V., Ilich, J. Z. (1993). Calcium requirements for growth: Are current recommendations adequate. *Nutr. Rev.*, 51, 6, 171-180.
 8. Abraham, G. E., Grewal, H. A. (1990). Total dietary programme emphasizing magnesium instead of calcium. *J. Repr. Med.*, 35, 503 - 507.
 9. Bender, A. Food and Nutrition (1983). *Acad. Press. L.NY.*
 10. Brown, K.H., Peerson, J.M., Allen, L.H. (1998). Effect of zinc supplementation on children's growth: A metaanalysis of intervention trails. Role of trace elements for health promotion and disease prevention. Basil. Karge: *Bibl. Nutr. Dieta.*, 76 – 83.
 11. PeresIchna, S.M., Rozumn,a N.V. (2013). TehnologIya chyzkeyklv znizhenoYi energetichnoYi tsInnostI. Harchovi dobavki. *Harchuvannya zdorovoYi ta hvoroYi lyudini shosta mlzhnarodna naukovopraktichna konferentsIya. m. Donetsk, DonNuET*, 132–134
 12. PeresIchna, S.M., Rozumna, N.V. (2013). Formuvannya pozhivnih vlastivostey chyzkeyklv znizhenoYi energetichnoyi tsinnosti. *Mizhdunarodna naukovopraktichna InternetkonferentsIya «Nauchnyie isledovaniya i ih prakticheskoe primenenie. Sovremennoe sostoyaniya i puti razvitiya Ivanovo.*, 95–98

DETERMINATION OF THE MASS CONCENTRATION OF IODINE IN THE VEGETABLE-CHEESE PASTES (P 10 - 14)

Vitaii Korzun, Karina Palamarek

The expediency of iodine-containing materials to create products with a high content of iodine is grounded. Aquatic powders are the most valuable raw materials for dietary supplements because they contain complex of vital, necessary for human body organic substances and minerals.

The technology of functional vegetable-cheese pastes is developed and scientifically grounded, their use as a part of food rations will solve the important task of providing population with sufficient amount of iodine in the form bound with organic compounds and other essence nutrients-synergists of iodine and contribute significantly to disease prevention, associated with iodine deficiency. Therefore, by method of inversion voltammetry there was defined the quantitative content of total iodine in vegetables and fruit paste which is one of the steps in the proof of the diets of various population groups in Ukraine for the prevention of iodine deficiency disorders. The research of the iodine content in vegetable-cheese pastes is done; it proves that the introduction of 3-5 % of dried kelp and 9 % powdered seafood in recipe provides a day need of the human body for iodine. Thus, the iodine content in ready-to-use pastes is 1,174... 1,742 mg/kg.

Keywords: iodine deficiency, vegetable-cheese pastes, powders of aquatic organisms, kelp, iodine, bioorganic iodine compounds.

References

1. Mikroelementy. (1991). Pod redakciej prof. M.V. Katalymova. *Inostrannaia literatura*, 196.
2. Kravchenko, V. I. (2008). Ocinyuvannya jododeficytny'x zaxvoryuvan' ta monitoryng yix usunennya : posib. dlya kerivny'kiv program. 3 vy'd. K.: "K.I.S.", 104.
3. Kozyarin, I.P., Korzun, V.N. (2009). Medy'kosocial'ni problemy' profilakty'ky' jododeficytny'x zaxvoryuvan', *My'steczstvo likuvannya*, 4, 39–43.
4. Korzun, V. N., Voronczova, T. O., Boloxnova, T. V., Derkach, A. V. (2011). Novi metody' u profilakty'ci ta likuvanni jododeficytnykh zaxvoryuvan u ditej. *Nauk.-prakt. zhurn. "Aktual'ni pytannya pediatriyi, akusherstva ta ginekologiyi". T, Ukrmedkny'ga*, 128–130.
5. Mazaraki, A.A., Peresichnyi, M.I., Kravchenko, M.F. ta in. (2012). Texnologiya charchovy'ch produktiv funktsional'nogo pry'znachennya: monogr. 2-ge vy'd., pererobl. i dop. K. : Ky'viv. nacz. torg.-ekon. un-t, 1116.
6. Korzun, V.N., Paracz, A.M., Bruslova, K.M. ta in. (2004). Novi pidxody' u vy'rishenni problemy' likvidaciyi jododeficytny'x zaxvoryuvan'. *Problemy' xarchuvannya*, 3, 21–25.

7. Aminina, N.M., Vy'shnevs'ka T.I. (2007). Sklad jodovmisny'x ekstraktiv z laminariyi yapons'koyi. Y'zvesty'ya vuzov. *Py'shhevaya texnologiya*, 1, 24–27.
8. Budnikov G.K. (2003). Osnovy sovremennoho elektrohimicheskogo analiza. M.: *Mir, Binom L3*, 592.
9. Hotimienko, S.A., Tjukova, G.F., Alejko-Ohevskij Ы.P., i dr. (2006). Rezul'taty mehlaboratornyh issledovaniy po opredeleniyu soderhaniv joda v jodirovanom moloimom belke razliunymi metodami. *Mikroulementy v medicine*, 3, 43–48.
10. Metodicheskie ukazaniya MUK 4.1.1481-03. (2003). Opredeleniv masovoj koncentracii joda v piševykh produktakh, prodovol'stvennom syr'e, piševykh i biologicheskikh aktivnykh dobavkakh na vol'tamperometriyem metodom. M. *Minzdrav Rossii*, 41.
11. Pod red. F.Љol'ca. (2006). Elektroanaliticheskie metody. Teorit i praktika. Per. s ang. M. *BINOM. Laboratorije znanij*, 326.
12. Tjukova, G.F., Savik, S.A., Hotimienko, S.A. (2004). Metody kolimetrovogo opredeleniv joda v piševykh produktakh i prodovol'stvennom syr'e. *Voprosy pitaniya*, 5, 105–123.
13. Kaz'min, V.D. (1999). Morskie sokroviša. M.: *Piševaya promyshlennost'*, 138.
14. Sokolov, S.B., Zamotaev I.P. (2000). Spravochnik po lekarstvennym rastenivm (fitoterapiya). M.: *Nedra*, 512.
15. Petriienko, L.K., Petriienko S.P. (2000). Cennyj produkt pitaniya. *Rybovodstvo i rybolovstvo*, 3, 17.
16. Dietelin, M. et al. (1999). Iodine an autoimmune phenolmena in the thyroide. *Nuklearmedizin*, 38, 5, 3-6.
17. Josern, T.N., Morrison, S., Farahe, M. (1984). Iodination by Thyroide Peroxidase. *Methods in Enzimology*, 107, 445–475.
18. Hetzel, B.S. (2000). Iodine and neuropsychological development. *J. Nutr*, 130(28). 493–495.
19. Hetzel, B.S. (1985). Iodine deficiency disorders (IDD) and their eradication. *Lancet*, 2, 1126–1129.
20. Diplock, A.T. et al. (1998). Functional food science and defense against restive oxidative species. *British J. Nutrition*, 80, 3, 77–112.
21. Lima, N., Medeiros-Neto J. (1984). Transient thyrotoxicosis in endemic goiter patients following exposure to a normal iodine intake. *Clin. Endocrinol*, 21, 6, 631–637.

Biological processes, biotechnology of food products, BAA

BIOTECHNOLOGICAL APPROACHES FOR THE PRODUCTION OF FUNCTIONAL FOODS AND SUPPLEMENTS FROM CEREAL RAW MATERIALS (P 15 - 19)

Leonid Kaprelyants, Olena Zhurlova

The present study addresses problems and solutions related to new functional food production. Cereals by-products such as bran contain 20 times more dietary fibers (48.6 g/100g), 15 times more total phenolic compounds (2700 $\mu\text{mol}/100\text{g}$), 10 times more flavonoids (810 $\mu\text{mol}/100\text{g}$) than wheat flour.

New biotechnological methods are based on adding of exogenous and endogenous enzymes to the grain and by-products as well as activation of the endogenous enzymes of raw material. In this study the different methods raw materials of processing were compared, and the highest yield of dietary fibers 70 - 78% was obtained with using a thermostable α -amylase. Subsequent cultivation of probiotic bacteria on the biopolymer complex of barley – dietary fibers and β -glucan, shows stimulating effect as prebiotic. It's found that the quantity of *Lactobacillus* cells is $3.5 \cdot 10^9$ CFU/ml and *Bifidobacterium* cells is $2 \cdot 10^9$ CFU/ml for. These results afford us to develop a number of synbiotic based on cereals by-products.

Keywords: cereals by-products, enzymatic treatment, functional products and food supplements.

References:

18. Biliaderis, C., Izydorczyk, M. (2007). *Functional Food Carbohydrates*. CRS Press, 559.
19. Haymaker, B. (2008). Technology of functional cereal products. N. – Y.: *CRS Press*, 548.
20. Kaprelyants, L.V., Zhurlova, E.D. (2013). Fitokomponenty zernovogo syr'ya: stroenie, svojstva, primeneniye. *Pishhevaya nauka i tehnologiya*, 4, 3-7.
21. Gibson, G., Rastall, R. (2006). Prebiotic: development and application. *Willy and Sons. Ltd*, 111–181.
22. Slavin, J. (2004). Whole grain and human health. *Nutr. Res. Rev.*, 17, 99–110.
23. Truswell, A. (2002). Cereal grains and coronary heart disease. *Eur. J. Clin. Nutr.*, 56, 1–14.
24. Sahyoun, N., Jacques, P., Zhang, X. (2006). Whole-grain intake is inversely associated with the metabolic syndrome and mortality in older adults. *Am. J. Clin. Nutr.*, 83, 124-133.
25. Slavin, J. (2003). Why whole grains are protective: biological mechanisms. *Proc. Nutr. Soc.*, 62, 129–134.
26. Adams, J., Engstrom, A. (2000). Dietary intake of whole grain recommendations. *Cereal Foods Worldwide*, 45, 75–79.
27. Flight, I., Clifton, P. (2006). Cereal grains in the prevention of disease. *Eur. J. Clin. Nutr.*, 60, 1145–1159.
28. Kaprelyants, L. (2009). Enzymes in food technologies. *Odessa: "Druk"*, 282–295.
29. Fritze, H. (1991). Process for producing a food-stuff of cereals. *Patent Application*, US 4254145.

30. Feast, R. (2000). Manufacturing technology of ready-to-eat cereals. *Cereal Chemistry*, 44, 452–471.
31. Salavaara, H. (2011). Lactic acid bacteria in cereal-based products. *London: CRS Press*, 207–245.
32. Kedia, G., Wang, K., Patel, H. (2007). Use of mixed cultures for the fermentation of cereal-based substrates with potential probiotic properties. *Process Biochem.*, 42, 65-70.
33. Rozada-Sanchez, R., Sattur, A. (2008). Evaluation of *Bifidobacterium spp.* for the production of a probiotic malt-based beverage. *Process Biochem.*, 43, 848-854.
34. Kedia, G., Vazquez, J. (2008). Fermentability of whole oat flour and bran by *L. plantarum*. *J. Food Eng.*, 89, 246-249.

THE DETERMINATION OF OPTIMUM CONDITIONS FOR OBTAINING FOOD SUPPLEMENTS WITH THE COMBINED EFFECT FROM *AGARICUS BISPORUS* (P 20 - 24)

Natalya Cherny, George Stankevych, Sophya Osolina, Aleksandra Nikitina

It is effectually to use drugs with the combined effect that show both enterosorbent and immunomodulatory properties in the prevention and correction of pathological states caused by the action of ecotoxicants. There are no such drugs and food supplements in Ukraine. Mushrooms contain the components with such activities. They include aminopolysaccharide and glucan. Using the mathematical modeling techniques it was found that the optimum conditions of isolation the food supplement from *Agaricus bisporus* is to treat the raw material from which water- and alkaline-soluble substances was previously removed with 6.8 % NaOH solution within 4.5 hours. The resulting product contains 40.0% glucan, 38.6 % aminopolysaccharide. It is effectually to include this food supplement as the preventive remedy to the diets of people who live in the regions with the high anthropogenic load. It can also be used as the additive agent in the correction of pathological states caused by the action of xenobiotics.

Keywords: food supplement, *Agaricus bisporus*, enterosorbent, immunomodulator, mathematical planning of multifactor experiments.

References

1. Ahmed R., Rouse B. (2005). Immunological memory. *Immunol Rev.*, 211, 5–337.
2. Xianchun Li., Schuler M., Berenbaum R. (2007). Molecular Mechanisms of Metabolic Resistance to Synthetic and Natural Xenobiotics. *Annual Review of Entomology*, 52, 231-253.
3. Bulucea C., Rosen M., Mastorakis N., Bulucea C., Brindusa C. (2012). Approaching Resonant Absorption of Environmental

- Xenobiotics Harmonic Oscillation by Linear Structures. *Sustainability*, 4, 561–573.
4. House R., Luebke R., Kimber I. (2006). Immunotoxicology and Immunopharmacology. *CRC Press*, 627.
5. Chang S.-T., Miles P.G. (2004). Mushrooms. Cultivation, Nutritional Value, Medicinal Effect, and Environmental Impact. *CRC Press: Boca Raton*, 451.
6. Cherny N., Osolina S., Nikitina A. (2013). Chemical composition of *Agaricus bisporus* and *Pleurotus ostreatus* fruiting bodies and their morphological parts. *Food and Environment Safety*, 12, 291-299.
7. Cherny N.K., Osolina S.A., Gural L.S., Nikitina A.V. (2013). Comparative analysis of biopolymer complexes from mushrooms (*Agaricus bisporus*). *Sbornik nauchnyh trudov SWorld. Materialy mezhdunarodnoj nauchno-prakticheskoy konferencii «Sovremennyye napravleniya teoreticheskikh i prikladnyh issledovaniy 2013»*, 37, 54-59.
8. Ostapchuk N.V., Kaminskij V.D., Stankevich G.N., Chuchuj V.P. (1992). Matematicheskoe modelirovanie processov pishhevyyh proizvodstv: *Sb. zadach: Ucheb. posobie. K.: Vishha shk.*, 175.

JASTIFICATION RATIONALE FOR CONTENT MILK-CLOTTING ENZYME CHY-MAX IN PRODUCTION SOFT PROBIOTIC CHEESES (P 24 - 29)

Dmitrii Skripnichenko, Natalia Tkachenko

The paper presents results of an experimental study related to determination of the adequate weight part of the standardized milk-clotting enzyme CHY-MAX in milk when producing soft probiotic cheeses, depending on the milk pasteurization mode, milk synergetic properties, duration of junket formation, content of dry matter and protein in the whey.

Appearance and weight part of the milk-clotting enzyme produce a considerable impact on the rennet clotting of milk and clot quality. In order to obtain soft probiotic cheeses with standard safety parameters, it is expedient to apply a high-temperature pasteurization process when treating raw milk. Application of the $t=(85\pm 1)^\circ\text{C}$ milk pasteurization technology for making soft probiotic cheeses with a time delay (2...3) min. deteriorates considerably the synergetic properties of junkets. To renew milk capacity to form high-quality junkets, it is required to use high ratio of calcium chloride – up to 40...45 g per 100 dm³ of milk. The experimental studies described in the paper have established that in order to renew the cheese-forming capacity of milk, which was pasteurized at high-temperature mode, it is required to apply a higher weight part of the milk-clotting enzyme CHY-MAX to the extent of 2,2 cm³ per 100 dm³ of milk.

Keywords: milk-clotting enzyme, clot, pasteurization, syneresis, probiotic, functional product.

References

1. Diplock, A.T., Aggett, P.J., Ashwell, M.A. et al. (1999). Scientific concept of functional foods in Europe: consensus document. *British J. Nutr.*, 81 (1), 1–27.
2. Richardson, D.P. (2002). Functional Food and Health Claims. *The world of Functional ingredients*, 9, 12–20.
3. Roberfroid, M.B. (2002). Global view on functional foods: European perspectives. *British J. Nutr.*, 88 (2), 133–138.
4. Ericson, K. L., Hubbard, N. E. (2000). Probiotic immunomodulation in health and disease. *J. Nutr.*, 2, 403–409.
5. Biavati, B., Bottazzi V., Morelli, L. (2001). Probiotics and Bifidobacteria. *Novara (Italy): MOFIN ALCE*, 79.
6. Collins, M. D., Gibson, G. R. (1999). Probiotics, prebiotics and synbiotics: dietary approaches for the modulation of microbial ecology. *Am. J. Clin. Nutr.*, 5, 1052 – 1057.
7. Kahan, Ya. R. (2009). Syry s probioticheskoi mikrofloroj. *Syrodellie i maslodellie*, 2, 24–27.
8. Sviridenko, Yu.Ya., Mordvinova, V.A. (2011). Innovatsionnye razrabotki v oblasti syrodellii. *Syrodellie i maslodellie*, 3, 17–19.
9. Hudkov, A. V. (2004). Syrodellie: tekhnologicheskie, biolohicheskie i fiziko-khimicheskie aspekty. *Moskva: DeLi Print*, 804.
10. Elchaninov, V.V. (2011). Kratkaia retroperspektiva primeneniia i izucheniiia molokosvertyvaiushchikh fermentov. *Syrodellie i maslodellie*, 3, 40–42.
11. Pastukhov, B.V. (2010). Molokosvertyvaiushchii fermentnyi preparat dlia miahkikh syrov. *Pererabotka moloka*, 8, 48.
12. Chaharovskii, A. P., Olesnevich, M. P. (2002). K voprosu o vybore koahuliantov dlia proizvodstva sychuzhnykh syrov. *Molochna promyslovict*, 2, 26–27.
13. Horina, T.A. (2010). Koahulianty i sychuzhnye fermenty dlia syrodellii. *Syrodellie i maslodellie*, 1, 22-23.
14. Didukh, N. A., Skripnichenko, D.M. (2013). Obosnovanie ratsionalnykh kontsentratsiy molokosvertyvaiushchikh inhredientov v tekhnologii miahkikh syrov s probioticheskimi svoistvami. *Universitetskaia nauka – rehionu: materialy I Vserossiiskoi nauchno-prakticheskoi konferentsii s mezhdunarodnym uchastiem, sektsiia: innovatsionnye napravleniia v pishchevykh tekhnologiiakh, 9-10 apreliia 2013h. Piatihorsk*, 96–103.
15. Bottazzi, V. (2003). Milk, enzymes & microorganisms. *Novara (Italy): MOFIN ALCE*, 154.

THE RESEARCH OF THE PRESERVATION PROCESS OF FERMENTED MILK CURD (P 29 - 34)

Yuliia Nazarenko

The results of experimental investigations of qualitative indicators determination of fermented probiotic curds, received by ripening of sterilized milk fortified with fructose, soured composition of mixing cultures *B. bifidum* 1 + *B. longum* Я3 + *B. infantis* 512 and mixing cultures of mesophilic sour-milk lactococci (ratio of cultures in composition 1:1:10:10 consequently) in the keeping process in amphibious package at a temperature 2...6 °C during 21 days, are stated in the work. Change of qualitative indicators of fermented probiotic curds received by ripening of sterilized milk fortified with fructose, soured compositions of monocultures *B. bifidum* 1 and mixing cultures of mesophilic sour-milk lactococci (ratio of cultures of bifid and lactic bacteria 1:10), monocultures *B. longum* Я3 and mixing cultures of mesophilic sour-milk lactococci (ratio of cultures of bifid and lactic bacteria 1:10), monocultures *B. infantis* 512 and mixing cultures of mesophilic sour-milk lactococci (ratio of cultures of bifid and lactic bacteria 1:1), in the similar conditions, was also investigated for comparison. On keeping of fermented probiotic curds a change of their acidity (titrated and active), viscosity, moisture-retaining power, quantity of viable cells of bifid bacteria and mesophilic sour-milk lactococci in 1 cm³ during 21 days with interval of 7 days, as well as change of organoleptic indicators was controlled. Using possibility of developed soured composition of mixing cultures *B. bifidum* 1 + *B. longum* Я3 + *B. infantis* 512 and mixing cultures of mesophilic sour-milk lactococci in producing of fermented milk products for infant food with improved storageability (at least 14 days), is illustrated.

Keywords: baby food, adaptation, bifidobacteria, lactic mesophilic lactococci, bifidogenic factor, fermentation, probiotic properties, acidity, viscosity, water-holding capacity.

References

1. Kuznecov, V. V., Lipatov, N. N. (2005). Spravochnik tehnologa molochnogo proizvodstva. *Tehnolo-gija detskih molochnyh produktov St. Petersburg: GIORD*, 525 s.
2. Ericson, K. L., Hubbard, N. E. (2000). Probiotic immunomodulation in health and disease. *J. Nutr.*, 2, 403–409.
3. Ribeiro, A.C., Ribeiro, S.D.A. (2010). Specialty products made from goat milk. *Small Ruminant Res.*, 9, 225–233.
4. Zakon Ukrainy "Pro dy`tyache xarchuvannya" (2006). *Vidomosti Verxovnoyi Rady Ukrainy*. 44, 1469–1476.
5. Bottazzi, V. (2003) Milk, enzymes & microorganisms. *Novara (Italy): MOFIN ALCE*. 154 p.

6. Molder, H. W., Makellar, R. C., Yaguchi, M. (1999). Bifidobacteria and bifidogenic factors. *Can. Inst. Food Sci. Technol. J.*, 23 (1), 29–41.
7. Biavati, B., Bottazzi, V., Morelli, L. (2001). Probiotics and Bifidobacteria. *Novara (Italy): MOFIN ALCE*. 79 p.
8. Collins, M. D., Gibson, G. R. (1999). Probiotics, prebiotics and synbiotics: dietary approaches for the modulation of microbial ecology. *Am. J. Clin. Nutr.* 5, 1052 – 1057.
9. Nazarenko, Y.V. (2011). Biotekhnologiya kyslomolochnoho syru dytyachoho kharchuvannya z podovzhenym terminom zberihannya. *Kharchova nauka i tekhnologiya. Odessa, ONAHT*. 2. 41–45.
10. Didukh, N. A., Chagarovs'kyj, O. P., Lysogo, T. A. (2008). Zakvashuvani kompozyciyi dlya vyrobnyctva molochnyx produktiv funkcional'nogo pryznachennya. *Odessa: Vydavnyctvo "Poligraf"*, 236 s.
11. Romanchenko, S.V., Didukh, N.A. (2012). Naukovi osnovy vyrobnytstva napoyu kyslomolochnoho dlya dytyachoho kharchuvannya z podovzhenym terminom zberihannya. *Nauk. Pratsi. Odessa: ONAHT*, 42, 2, 251–259.

Chemistry of food products and materials. New raw materials

THE ASSESSMENT OF THE SANITARY INDICATORS OF THE SPICY-AROMATIC RAW MATERIALS AND SPICY-OIL MIXTURES (P 34 - 38)

Bogdan Yegorov, Nadiia Mohylianska

The authors suggested to carry through the oil extraction of spices to accumulate their fat-soluble components in the unrefined sunflower oil salad. In this work the sanitary quality indicators of the spicy-aromatic raw materials and their oil mixtures are explored. A black pepper (*Piper nigrum*), a coriander (*Coriandrum sativum*), a cardamoms (*Ellettaria cardamomum*), a garlic (*Allium sativum*), a fragrant basil (*Ocimum basilicum*), a bay leaf (*Laurus nobilis*) have been investigated as the spicy-aromatic raw materials. The initial semination by the microorganisms of the spicy-aromatic raw materials and the spicy-oil mixtures after the extraction is examined. It was very high in all selected spices except the garlic. High semination of the spicy-aromatic raw materials has an influence on the initial semination of the spicy-oil mixtures. Therefore it was studied several ways to prepare spices before carrying in unrefined oil: washing raw material, followed by drying in natural air-cooling, convective drying at the temperature of +100 °C and processing of ultrahigh frequency waves. The antibiotic effect of the mixture is expressed slightly when the concentration of the raw material up to 1.5%. The number of the microbial cells after the extraction is closed to the original value. The stabilization of the microorganisms' growth and the suppression of their activity is observed with the increasing of the content of the spices in the source systems in the ready spicy-oil mixtures. This indicates that the fat-soluble components of the spicy-oil mixtures, which are moving from the spicy-aromatic raw materials, have the antibiotic action against the microorganisms, which are caught in the oil with the spices. The manifested antibiotic effect corresponds to the concentration of the spicy-aromatic raw materials in a mixture of 2% and more.

Keywords: spicy-aromatic raw materials, spicy-oil mixtures, antibiotic activity, black pepper, coriander, cardamoms, garlic, fragrant basil, bay leaf.

References:

1. Panchenko, V. J. (2013). Novi naukovi rozrobki u galuzi harchovih tehnologij // *Visnyk Natsionalnoho tekhnichnoho universytetu "KhPI"*, 38, 178 – 182.
2. Mjuller, V.V., Litc, P., Mjunh, G.D. (1977). *Mikrobiologija pishhevyyh produktov rastitel'nogo proishozhdenija*. M.: Pishhevaja pr-t'. 344.
3. Buldakov, A. S. (1996). *Pishhevye dobavki. Spravochnik*. SPb.: «Ut». 240.
4. Isupov, V.P. (2000). *Pishhevye dobavki i prjanosti. Istorija, sostav i primenenie*. SPb.: GIORD. 176.
5. Smallfield, Bruce M., van Klink, John W., B. Perry, Nigel, Kenneth, G. (2001). Dodds Coriander Spice Oil: Effects of Fruit Crushing and Distillation Time on Yield and Composition. *J. Agric. Food Chem.*, 49, 1, 118–123.
6. Kerrola, K., Kallio, N. (1992). Application of liquid carbon dioxide to the extraction of essential oil of coriander (*Coriandrum sativum* L.) fruits. *J. Agric. Food Chem.*, 195, 3, 545–549.
7. Potter, T.L. (1996). Essential oil composition of cilantro. *J. Agric. Food Chem*, 44, 7, 1824–1826.
8. Misharina, T.A (2001). Vlijanie uslovij i srokov hranenija na sostav komponentov jefirnogo masla semjan koriandra. *Prikladnaja biohimija i mikrobiologija*, 37, 6, 726–732.
9. Misharina, T.A., Samusenko, A.L. (2008). Antioksidantnye svojstva jefirnyh masel limona, grejppfruta, koriandra, gvozdiki i ih smesej. *Prikladnaja biohimija i mikrobiologija*, 44, 4, 482–486.
10. Ryzhenkov, V.E., Makarov, V.G. (2003). Biologicheski aktivnye veshhestva chesnoka i ih ispol'zovanie v pitanii cheloveka. *Voprosy pitaniya*, 4, 42–46.
11. Block, E., Ahmad, S., Jnin, M. et al (1984). Ajoene: a potent antithrombotic agent from garlic. *J. Am. Chem. Soc.*, 106, 8295–8296.
12. Weinberg, D.S. et al (1993). Identification and quantification of organosulfur compliance markers

- in a garlic extract. *J. Agric. Food Chem.* 41, 37–41.
13. Amagase, H. (2000). Intake of garlic and its bioactive components. *Phytotherapy*, 7, 51
 14. Phelps, S., Harris, S. (1993). Garlic supplementation and lipoprotein oxidation susceptibility. *Lipids*, 28, 475–477.
 15. Silagy, C.A., Neil, N.A. (1994). Garlic as a lipid lowering agent—a metaanalysis. *J. Hypertens*, 12, 463–468.
 16. Ruber, G., Baratta, M. (2000). Antioxidant activity of selected essential oil components in two lipid model systems. *Food Chem.*, 69, 1, 167–174.

INHIBITION OF CRYSTALLIZATION PROCESSES OF FUNCTIONAL DIACYLGLYCEROL ENRICHED FATS (P 39 - 44)

Nataliia Tkachenko Pavlo Nekrasov

The present work is dedicated to the improvement of consumer appeal of diacylglycerol-enriched fats of a well-balanced fatty acid composition, and the ratio of polyunsaturated fatty acids ω -6/ ω -3 of 10:1 in particular. Conventional refrigerated storage (at +5 °C), of the said functional fats may result in forming of a crystalline phase, which leads to the unwanted turbidity of the product, as well as its further stratification and precipitation. A range of compound polyglycerol ethers have been used as crystallization inhibiting agents. Comprehensive studies have been carried out using the response surface methodology. Simulation and experimental data processing were performed using Statistica 10 (StatSoft, Inc.) package. The response function was the solids content of fats, which was established by the pulsed nuclear magnetic resonance. A mathematical model allowing to predict the formation of crystalline phases with different values of predictors – the fatty acid composition of polyglycerol esters and their concentration – was developed. Rational parameters ensuring the minimization of solids deposition in functional fats have been established.

Keywords: diacylglycerols; polyglycerol esters of fatty acids, methodology of response surface, fats glycerolysis, lipase.

References:

1. Smith, J., & Charter, E. (2010). *Functional food product development* (1st ed.). Chichester, West Sussex: Wiley-Blackwell.
2. Tutel'yan, V., Nechaev, A., Kochetkova, A. (2009). Funktsional'nye zhirovye produkty v strukture pitaniya. *Maslozhirovaya promyshlennost'*, 6, 6–9.
3. Ipatova, L., Kochetkova, A., Nechaev, A. (2007). Novye napravleniya v sozdanii funktsional'nykh zhirovnykh produktov. *Pishchevaya promyshlennost'*, 1, 12–15.
4. Illarionova, V., Efimenko, S., Kornena, E. (2010). Razrabotka kompozitsionnykh smesey zhirovnykh osnov nizkokaloriynykh margarinovykh emul'siy funktsional'nogo naznacheniya. *Novye tekhnologii*, 2, 43–47.
5. Wolfs, M., De Jong, N., Ock'e, M., Verhagen, H., & Monique Verschuren, W. (2006). Effectiveness of customary use of phytosterol/-stanol enriched margarines on blood cholesterol lowering. *Food And Chemical Toxicology*, 44(10), 1682–1688.
6. Su, H., Lien, C., Lee, T., & Ho, J. (2010). Development of low-fat mayonnaise containing polysaccharide gums as functional ingredients. *Journal Of The Science Of Food And Agriculture*, 90(5), 806–812.
7. *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*. (2005). Washington, D.C.: National Academies Press.
8. Chow, C. (2008). *Fatty Acids in Foods and their Health Implications. Food Science and Technology, Volume 170* (1st ed.). CRC Press.
9. Barcelos, R., Benvegnú, D., Bouffleur, N., Reckziegel, P., Müller, L., & Pase, C. et al. (2010). Effects of ω -3 essential fatty acids (ω -3 EFAs) on motor disorders and memory dysfunction typical neuroleptic-induced: behavioral and biochemical parameter. *Neurotoxicity Research*, 17(3), 228–237.
10. Coluccia, A., Borracci, P., Renna, G., Giustino, A., Latronico, T., Riccio, P., & Carrat'u, M. (2009). Developmental omega-3 supplementation improves motor skills in juvenile-adult rats. *International Journal Of Developmental Neuroscience*, 27(6), 599–605.
11. Schnebelen, C., Grégoire, S., Pasquis, B., Joffre, C., Creuzot-Garcher, C., & Bron, A. et al. (2009). Dietary n-3 and n-6 PUFA enhance DHA incorporation in retinal phospholipids without affecting PGE1 and PGE2 levels. *Lipids*, 44(5), 465–470.
12. Ishihara, K., Komatsu, W., Saito, H., & Shinohara, K. (2002). Comparison of the effects of dietary α -linolenic, stearidonic, and eicosapentaenoic acids on production of inflammatory mediators in mice. *Lipids*, 37(5), 481–486
13. Riediger, N., Othman, R., Suh, M., & Moghadasian, M. (2009). A systemic review of the roles of n-3 fatty acids in health and disease. *Journal Of The American Dietetic Association*, 109(4), 668–679.
14. Basu, H., Pernecky, S., Sengupta, A., & Liepa, G. (2006). Coronary heart disease: How do the benefits of ω -3 fatty acids compare with those of aspirin, alcohol/red wine, and statin drugs? *Journal Of The American Oil Chemists' Society*, 83(12), 985–997.
15. Lavie, C., Milani, R., Mehra, M., & Ventura, H. (2009). Omega-3 polyunsaturated fatty acids and cardiovascular diseases. *Journal Of The American College Of Cardiology*, 54(7), 585–594.
16. Meyer, B., Mann, N., Lewis, J., Milligan, G., Sinclair, A., & Howe, P. (2003). Dietary intakes and food sources of omega-6 and omega-3 polyunsaturated fatty acids. *Lipids*, 38(4), 391–398.

17. Morise, A., Combe, N., Boué, C., Leger, Catheline, D., & Delplanque, B. et al. (2004). Dose effect of α -linolenic acid on PUFA conversion, bioavailability, and storage in the hamster. *Lipids*, 39(4), 325–334.
18. Loosemore, E., Judge, M., & Lammi-Keefe, C. (2004). Dietary intake of essential and long-chain polyunsaturated fatty acids in pregnancy. *Lipids*, 39(5), 421–424.
19. Stewart, F., Rodie, V., Ramsay, J., Greer, I., Freeman, D., & Meyer, B. (2007). Longitudinal assessment of erythrocyte fatty acid composition throughout pregnancy and post partum. *Lipids*, 42(4), 335–344.
20. Piquet, M., Roulet, M., Nogueira, V., Filippi, C., Sibille, B., & Hourm, et al. (2004). Polyunsaturated fatty acid deficiency reverses effects of alcohol on mitochondrial energy metabolism. *Journal Of Hepatology*, 41(5), 721–729.
21. Sikorski, Z., & Kolakowska, A. (2011). *Chemical, biological, and functional aspects of food lipids* (1st ed.). Boca Raton: CRC Press, Taylor & Francis Group.
22. Moffatt, R., & Stamford, B. (2006). *Lipid metabolism and health* (1st ed.). Boca Raton, FL: CRC/Taylor & Francis.
23. Akoh, C., & Min, D. (2008). *Food lipids* (1st ed.). Boca Raton: CRC Press/Taylor & Francis Group.
24. Smith, J., & Charter, E. (2010). *Functional food product development* (1st ed.). Chichester, West Sussex: Wiley-Blackwell.
25. Nekrasov, P., Gladkiy, F. (2006). Zhiry, obogashchennye diatsilglitserinami, – produkt novogo pokoleniya / *Food & Drinks. Produkty i napitki. – seriya "Food Technology. Pishchevytekhnologii"*, 10, 28–29.
26. Nekrasov, P., Podlisna, O., Hopkalov, V. (2010). Doslidzhennia kharchovoi tsinnosti diatsylhlitserynovoii olii. *Visnyk Natsionalnoho tekhnichnoho universytetu "KhPI"*, 11, 170–177.
27. Box, G., & Draper, N. (2007). *Response surfaces, mixtures, and ridge analyses* (1st ed.). Hoboken, N.J.: John Wiley.

THE COMPOSITION INFLUENCES OF THE TWO-LAYER PROPERTIES OF ENVIRONMENTAL IN VERTICAL COAXIAL EXTRUSION TECHNOLOGY (P 45 - 48)

Evgeniya Korotaeva

Physical characteristics of the two-layer receiving environment is one of the stabilization factors of technological process of adipose capsule production. The process of coaxial vertical extrusion of the technology of receiving thermally stable adipose capsule is carried out by establishing quantitative relationships of hydroalcoholic layer densities, a two-layer forming environment. Stable vertical capsulation process will allow to obtain capsules, the innovation of which lies in the ability of a shell to be heat-resistant edible pack

with a precise dosage of fat content. The capsulated product can act as intact fats in the form of semifinished products of high readiness and a separate product for culinary production, and food industry; and also biologically active additive, fats of the directed therapeutic and preventive action.

Using the method of statistical design planning the experiments "structure – property" allowed us to study the effect of the components' concentrations on the density of the samples of hydroalcoholic lower layer, the regularities of which, ensured the formation of physical capsules' form with the specified dimensions in the top layer of two-layer receiving environment. To ensure unobstructed gravitational transition of adipose capsules from the top layer of a two-layer receiving environment to the hydroalcoholic lower layer it's necessary to introduce the surface-active agent, lecithin, which has GRAS and Tween 20 status, the most appropriate for "oil – hydroalcoholic layer" system.

Keywords: density, the process of encapsulation, ethanol, the interphase layer, the statistical method of planning

References:

1. De Man, J.M. (2006). Principles of Food Chemistry. Westport, Conn: Avi Publish Co Inc., 426.
2. McHugh, D. J. (2003). A guide to the seaweed industry. Rome, FAO: FAO Fisheries Technical Paper, 5, 441–105.
3. Fennema, O.R. (ed.). (1985). Food chemistry. New York, Basel, Marcel: Denker Inc., 991.
4. Morch, Y. A. (2007). Molecular Engineering as an Approach to Design New Functional Properties of Alginate. *Biomacromolecules*, 8, 2809–2814.
5. Hannigan, K. (1993). Structured fruit. *Food Engineering*, 3, 48–49.
6. Makarov, V.G., Detali V.A., Shyshkov A.N. Pat. Rossiya 2 157 192 C1, MPK⁷ A 61 K 9/48. Myagkaya zhelatinovaya kapsula. 99111660/14, zayavl. 01.06.1990, opubl. 10.10.2000.
7. Pivovarov, P.P., Grynchenko O.O., Pivovarov Ye.P., Nagornyy O.Yu. Pay. Ukraina 94959 C2, MPK⁷ A23P1/04, A61K9/48. Sposib oderzhannya zhelatynovyh kapsul z vmistom zhirovoyi I vodnoyi fazy. a200901885, zayavl. 03.03.2009; opubl. 25.06.2011.
8. Gaserod, Olav, Christian Klein Larsen, Peder Oscar Andersen. Pat. SCHA 20110059165 A1, MPK A61K35/60, A61K9/48, B01J13/20, A61P3/02. APK 424/451, 424/523, 264/4.3. Seamless alginate capsules. 12/874,567; zayavl. 02.09.2010, opubl. 10.03.2011.
9. Ryabez, O. (2008). Tehnologiya analogy ikry chornoyi z vyukoryustannyam alginaty natriyu, dysertaciya kand. techn. nauk 05.18.16, *Harkiv, Harkivskiy derg. un-t kharchuvannia ta tovgivli*.
10. Rabinovich, V., Havin, Z. (1978). Brief chemical Handbook, Kratkiy himicheskij spravochnik, Publ. 2, corrected and added, Leningrad: Himiya, 280.
11. Agape, B.D., Belov, V.N., Kesamanly I.P. i dr. (2001). Obrabotka eksperimentalnyh dannyh,

Electronnyi resurs. Sankt-Petersburg, Izd-vo SBbGTU, Regim dostupa.

12. Sanitarni pravyla i normy po zastosuvannu harchovyh dobavok. (1996) *Zatverdgeno Nakazom*

MOZ Ukrainy vid 23 lypnia 1996 r. № 222, z 16 grudnia 1996 r. K. 66.

Technology and safety of food products

INNOVATIVE TECHNOLOGY OF COMBINED BIFIDUS CONTAINING FERMENTED MILK DRINKS OF FUNCTIONAL

PURPOSE (P 49 - 56)

Pavlo Nekrasov, Nataliia Tkachenko

This paper shows the prospects of functional dairy market growth in Ukraine; it lists physiologically functional food ingredients, and outlines the benefits of use of probiotics, prebiotics and synbiotics in the production of dairy products; five groups of bifidus containing functional dairy products have been analyzed here, as well as the promising development perspectives of the third, fourth and fifth groups of these products; the feasibility of development of scientific and practical basis of technologies of new bifidus containing fermented milk drinks of the third group of milk-cereal based drinks was proved here, using the direct introduction of bacterial concentrates of monocultures or mixed cultures of milk adapted bifidobacteria for biotechnological processing of combined raw materials; the innovative technology of bifidus containing combined fermented milk drinks was developed and its description was given; this paper outlines the prospects of manufacturing application of the developed technology.

Keywords: functional combined fermented milk product, technology, probiotic, prebiotic, symbiotic, bifidobacterium, bifidogenic factor, adaptation.

References

- Richardson, D. (2002). Functional Food and Health Claims. *The world of Functional ingredients*, 9, 12–20.
- Roberfroid, M. (2002). Global view on functional foods: European perspectives. *British Journal Of Nutrition*, 88(S2), 133–138.
- Diplock, A., Aggett, P., Ashwell, M. et al. (1999). Scientific concept of functional foods in Europe: consensus document. *British Journal Of Nutrition*, 81 (1), 1–27.
- Kaprelyants, L., Iorgachova, E. (2003). *Funktsionalni produkty*. Odesa: Druk. ISBN 966-8099-83-4.
- Didukh, N., Chaharovskyy, O., Lysohor, T. (2008). *Zakvashuvalni kompozytsiyi dlya vyrobnytstva molochnykh produktiv funktsionalnoho pryznachennya*. Odesa: Vydavnytstvo «Polihraf». ISBN 978-966-8788-79-6.
- Biavati, B., Bottazzi, V., Morelli, L. (2001). Probiotics and Bifidobacteria. *Novara (Italy): MOFIN ALCE*, 79.
- Rolfe, R. (2000). The role of probiotic cultures in the control of gastrointestinal health. *The Journal Of Nutrition*, 130(2), 396–402.
- Sanders, M. (2000). Considerations for use of probiotic bacteria to modulate human health. *The Journal Of Nutrition*, 130(2), 384–390.
- Shah, N. (1997). Bifidobacteria: characteristics and potential for application in fermented milk products. *Milchwissenschaft*, 52(1), 16–20.
- Shah, N. (2000). Probiotic bacteria: selective enumeration and survival in dairy foods. *Journal Of Dairy Science*, 83(4), 894–907.
- Reddy, B. (1999). Possible mechanisms by which pro-and prebiotics influence colon carcinogenesis and tumor growth. *The Journal Of Nutrition*, 129(7), 1478–1482.
- Roberfroid, M. (2000). Prebiotics and probiotics: are they functional foods?. *The American Journal Of Clinical Nutrition*, 71(6), 1682–1687.
- Roberfroid, M. (1998). Prebiotics and synbiotics: concepts and nutritional properties. *The British Journal Of Nutrition*, 80(4), 197–202.
- Schrezenmeir, J., de Vrese, M. (2001). Probiotics, prebiotics, and synbiotics – approaching a definition. *The American Journal Of Clinical Nutrition*, 73(2), 361–364.
- Collins, M., & Gibson, G. (1999). Probiotics, prebiotics, and synbiotics: approaches for modulating the microbial ecology of the gut. *The American Journal Of Clinical Nutrition*, 69(5), 1052–1057.
- Didukh, N. (2008). Naukovi osnovy vykorystannya chystykh kultur *Bifidobacterium bifidum* dlya vyrobnytstva fermentovanykh funktsionalnykh molochnykh produktiv. *Molochna prom-ct*, 4, 49–54.
- Didukh, N. (2008). Naukovi osnovy vykorystannya symbiotychnykh kompleksiv z chystymy kultyramy *Bifidobacterium longum* u vyrobnytsti fermentovanykh funktsionalnykh molochnykh produktiv. *Molochnoe delo*, 3, 12–13, 4, 34–35, 5, 38–39.

FEATURES OF ICE-CREAM FOAM STRUCTURE FORMATION (P 56 - 60)

Galyna Polischuk, Sergii Ivanov, Nataliya Breus

The systems analysis of the regularity of ice-cream structure formation and stabilization with the different chemical composition regarding the fat content ranging 0–20 %, dry skimmed milk residue – 6–14 %, sugar – 12–20 %, stabilizing system – 0,2–1,0 % has been conducted. The overrun changes,

the air inclusion sizes as well as the ice-cream thawing resistance under the different ratio of the above-mentioned components have been investigated. The multifactorial mathematical models which properly describe the dependence of the overrun, mean diameter of the air bubbles and thawing resistance on the ice-cream chemical composition have been got by using the mathematical packet MathCAD 15. For a more thorough study of separate components influence on ice-cream physical and chemical characteristics, two dimensional regression models which describe the changes of the overrun and the air bubble mean diameter under the variability of two independent factors («MSNF/stabilizing system», «fat/sugar») have been developed. This study shows that it is much more complicated to reach the balance between the constituent components for the ice-cream with low content of fat and non-fat one. The recommendations on how to create the recipe of the ice-cream with low content of fat and non-fat one have been elaborated.

Key words: ice-cream, chemical composition, optimization.

References

1. Marshall, R. T., Goff, H. D., Hartel, R. W. (2003). Ice Cream. [6th Edn.] *New York: Kluwer Academic*, 371.
2. Hartel, R. W. (1998). Mechanisms and kinetics of recrystallization in ice cream. *Properties of Waters in Foods : ISOPOW 6; Reid, D. S., Ed., Blackie Academic & Professional : New York*, 287–319.
3. Goff, H. D., Hartel, R. W. (2004). Ice cream and frozen desserts. *Frozen Foods; Hui, Y.A., Ed.; Marcel Dekker: New York*, 494–565.
- A. Kilara, R., Chandan, N. Shah (2008). Ice cream and frozen desserts. *Dairy Processing & Quality Assurance. Eds. : Wiley-Blackwell: New Delhi, India*, 364–365.
4. Turan, S., Kirkland, M., Trusty, P. A. (1999). Interaction of Fat and Air in Ice Cream. *Dairy Industry International*, 64, 1, 27–31.
5. Guinard, J.-X., Zoumas-Morse, C., Mori, L. [et al.] (1996). Effect of Sugar and Fat on the Acceptability of Vanilla Ice Cream. *Journal of Dairy Science*, 79, 11, 1922–1927.
6. Chang, Y., Hartel, R. W. (2002). Stability of Air Cells in Ice Cream during Handening and Storage. *Journal of Food Engineering*, 55, 11, 59–70.
7. Olenev, Y.A., Tvorogova, A.A., Kazakova, N.V., Soloviova, L.N. (2004). Spravochnik po proizvodstvu morozhenogo. *M, DeLi Print*, 798.
8. Tipova technologichna instrukcija z virobnitstva moroziva molotchnogo, verchkovogo, plombiru, plodovo-jagidnogo, aromatitchnogo, cherbetu, liodu, moroziva z kombinovanim skladom sirovini. TTI 31748658-1-2007 do DSTU 4733:2007, 4734:2007, 4735:2007. K.: Asociasia ukraïnskich virobnikov «Ukraincke morozivo ta zamorozeni produkti», 100.
9. Alexeev, E.R. (2006). Rechenije zadatch vitchislitelnoi matematiki v paketach Mathcad 12, MATLAB 7, Maple 9, *M: NT Press*, 496.

SOME ASPECTS OF COOKED FROZEN SHRIMP SAFETY (P 61 - 64)

Marina Mardar, Svitlana Pambuk, Yuliya Lyashenko

The article contains a review and critical analysis of a regulatory document being in force in Ukraine that sets the requirements pertaining to the quality of cooked frozen shrimps. The document analysis has shown that there are no clear strict requirements to the glaze weight and chemical quality indicators, and that permissible limit of heavy metals is high if to compare with European standards.

Cooked frozen shrimps samples of five different trademarks were studied to their quality. The research results have proved information and quantitative falsification to be present in all samples and inconsistency in microbiological figures in some of some of them. Namely, actual net weight of two of five samples was about twice lower than that indicated on the package, i.e. their weight was indicated inclusive of glaze which contradicts the requirements of the regulatory document. Only two of five samples meet the requirements of the regulatory document with regard to their microbiological figures. This fact suggests that additional thermal treatment is required before consumption which, certainly, has an adverse effect on organoleptic properties of final product.

The article points out the necessity of improvement of the regulatory document and harmonization of Ukrainian standards with the European ones.

Keywords: cooked frozen shrimps, quality indicators, safety indicators, regulatory document.

References

1. Nanna Roos, Md. Abdul Wahab, Chhoun Chamnan, Shakuntala H. Thilsted. (2007) The Role of Fish in Food-Based Strategies to Combat Vitamin A and Mineral Deficiencies in Developing Countries. *J. Nutr.*, 137, 1106–1109
2. Poznyakovskiy, V.M., Ryazanova, O.A., Kalenik, T.K., Datsun V.M. (2005). Ekspertiza ryby, moreproduktov i nerybnykh ob'ektov vodnogo promysla. *Kachestvo i bezopasnost. Novosibirsk: Sib. univ. izd.-vo*, 311. ISBN 5-94087-041-4
3. Skladchikov, V. (2013) Vodnyie resursy i aspekty kontrolya. *J. Mir produktov*, № 8 (97) Published on the web: http://www.prodinfo.com.ua/proizvodstvo/ryba_i_moreproduktyi/ryinok/vodnyie_resursyi_i_aspektyi_kontrolya.html
4. Litvinov, V.I. (2011) Ekonomichni ta ekologichni problem rybnogo gospodarstva Ukrainy. *J. Rybne gospodarstvo Ukrainy*, 3, 3–6.
5. Korman, I.I. (2012). Analiz otechestvennogo rynku ryby i moreproduktov i factory, kotoryie opredeliaut povedenie potrebiteliev na etom rynkie. *Vestnik Vinnitskogo politekhnicheskogo ins.*, 4, 50–55.
6. Mikhneva, Y., Lebskaia, T. (2011) Rynok ryby v Ukrainie i perspektivy yego razvitiya Published on

the web: <http://agrocomplex.info/rynok-ryby/13-rynok-ryby-v-ukraine-i-perspektivy-ego-razvitiya.html>

7. Nesar Ahmed, Faisal Ahammed and Martin Van Brakel (February 2008) An Economic Analysis of Freshwater Prawn, *Macrobrachium rosenbergii*, Farming in Mymensingh, Bangladesh. *Journal of the World Aquaculture Society*, 39, 1, 37–50
8. Jeffery A., Foran, David, H. Good, David, O. Carpenter, M. Coreen Hamilton, Barbara A. Knuth, and Steven J. Schwager (November 2005) Quantitative Analysis of the Benefits and Risks of Consuming Farmed and Wild Salmon. *J. Nutr.*, 135: 2639–2643
9. Abernathy, Carles O., Thomas, David J., Calderon, Rebecca L. (2003) Nutritional factors may modify the toxic action of methyl mercury in fish-eating populations. *Journal of Nutrition*, 133 (5s-1), 153–1543.
10. Bellinger, D. C.; Bolger M.; Carrington C.; Dewailly E.; Magos L. P. A.; Petersen B. (2000) Methylmercury. WHO *Food Additives series (safety evaluation of certain Food Additives and Contaminants)*, 44, 313–391.
11. Gary, J. Myers, Philip W. Davidson, and J. J. Strain (December 2007) Nutrient and Methyl Mercury Exposure from Consuming Fish *J. Nutr.* 137: 2805–2808
12. Commission Regulation (EC) № 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs/ Official Journal of the European Union. Published on the web: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:364:0005:0024:EN:PDF>

EFFECT OF THE RATIO TO THE PROTEIN-POLYPHENOL COMPLEX GEMA ON THE STATE IN THE BLOOD-SLAUGHTERING OF GRAPE POMACE (P 65 - 68)

Galina Shlapak

The article is devoted to solving problems of asiderotic anemia by creating a natural iron-bearing additive based on slaughterhouse blood and grape pomace. The relevance of this work is due to wide prevalence of asiderotic anemia in Ukraine especially among women and children. According to the World Health Organization nearly 1.8 billion people in the world are suffering from asiderotic anemia. The use of chemicals is highly undesirable because it may lead to side effects. Technology for producing this additive is a completely new, as it is based on the formation of complexes between iron in slaughterhouse blood and polyphenolic substances in grape pomace. It is shown that it is possible to maintain iron in the trivalent state in the form of protein-polyphenol complex for better absorption by man. The formation of such complexes is possible only under certain conditions, among which the most important is the ratio of the components. To

analyze the stability of the forms of hemoglobin a spectrophotometric method on devices CФ-56 and Specord-M and in the spectral region from 300 nanometers to 750 nanometers has been used. On the basis of spectral characteristics and the electron transport activity of blood, grape pomace, the optimal ratio of the components contributing to the stabilization of iron in the complex has been established.

Keywords: slaughterhouse blood, grape pomace, spectral characteristics, electron transport activity.

References:

1. Conrad, M.E., Umbreit, I.N., Moore, D. (1996). Heiman. Mobilferrin is an intermediate in iron transport between transferring and hemoglobin in K 562 *J. Clin. Invest.*, № 98, 54–107.
2. Gunshin, B. Mackeunzie, U. Berger at al. (1997). Cloning and characterization of mammalian protein-coupled metal-ion transporter. *Nature*, 388, 8–22.
3. Junsuittiviechakul, O.R., Mahone, J.W., Cornfarth, D.P. (1985). Effectual heat treatment on bioavailability of meat and hemoglobin iron feculto anaemic rats. *J.A. Food Ici*, 60, 407–409.
4. Irjak L. I. (1975). Gemoglobini i ih svojstva. *M.: Nayka*, 235 .
5. Starodyb, N. F. (1987). Geterogennaja sistema gemoglobina. Stryktyra, sintez, biologicheskaja rol'. *Kiev: Naykova dymka*, 197 .
6. Rogov, I. A., Antipova, L.V., Dynchenko, N.I. (2000). Himija pishi. *M.: Kolos*, 383 .
7. Evlash V.V. (2009). Naychnoe obosnovanie tehnologii dieticheskoy dobavki i pishevih prodyktov antianemicheskoy napravlenosti so stabilizirovannim gemovim jelezom. Harkov, 381 .
8. Lerina, V., Evlash, V.V., Rozanova, E.D. i dr. (2003). Kachestvennie harakteristiki biologicheski aktivnih dobavok iz modifizirovannoj boenskoj krovi. *Progresivni resyrsozberigauchi tehnologij ta jch ekonomichne obgryntyvannja y pidpriemctvach harchyvannja. Ekonomichni problevi tovgovli: zb. nayk. prac' y 2-x ch. HDYHT. H.*, 4.1, 414–418.
9. Evlash, V.V., Pogojih, N.I., Chernova, L.A. i dr. (2008). Issledovanie funkcional'no-technologicheskich svojstv dobavki "Gemovital". *Mechanizacija sil'skogospodarskogo virobniectva i tehnologii harchovih virobniectv (serija: tehnicni nayki): zb. nayk. prac'. Lyg.nac.agrarnii.yn-t. – Lygansk*, № 87, 62–66.
10. Evlash, V.V., Pogojih, N.I., Vinnikova, V.A. (2004). Aktyalnost' primenenija biologicheski aktivnih dobavok v profilaktike jelezodeficitnih sostojanii I rekomendacii po ich vneseniy v funkcionálne prodykti pitanija. *Vostochno-evropejskij jyrnal peredovih tehnologij*, 2(8), 22–24.
11. Finch, C. (1994). Regulators of iron balans in humans. *Blood*, № 84, 702 – 719.
12. Crouch S.P., Slater K.J., Fletcher J. (1992). Regulation of cytokine release from mononuclear cells

- by the iron-binding protein lactoferrin. *Blood*, 80, 40 – 61.
13. Umbreit, J.N., Conrad, M.E., Simovich, M. et al. (2000). Identification and localization of iron transport proteins in normal and deficient cells. *Blood*, № 96, 221 – 217.
 5. Lee, B-L., and Ong, C-N. (2000) Comparative analysis of tea catechins and theaflavins by high-performance liquid chromatography and capillary electrophoresis. *J. Chromatogr*, 439–447.
 6. Labbe, D., Tremblay, A., & Bazinet, L. (2006). Effect of brewing temperature and duration on green tea catechin solubilization: Basis for production of EGC and EGCG-enriched fractions. *Separation and Purification Technology*, 49(1), 1–9.
 7. Kyle, J. A., Morrice, P. C., McNeill, G., Duthie, G. G. (2007). Effects of infusion time and addition of milk on content and absorption of polyphenols from black tea. *Journal of Agricultural and Food Chemistry*, 55(12), 4889–4894.
 8. Danrong, Z., Yuqiong, C., Dejiang, N. (2009). Effect of water quality on the nutritional components and antioxidant activity of green tea extracts. *Food Chemistry*, 113, 110–114.
 9. Pokhlobkin, V. V. (2007) Chai. Centrpoligraf, 208. ISBN: 5-9524-1354-4.
 10. Veisin, U. (2005). Entsyklopedyia tselebnogo chaia. Sankt-Peterburg: Neva, 320. ISBN 5-7654-4299-4.
 11. Souz-inform (2011) Rynok chaisu v Ukraini v 2011 hodu [Text]. Retrieved from <http://www.souz-inform.com.ua/index.php?language=rus&menu=article/tea>
 12. Bieliaieva A. M. (2007) Sbornyk tekhnolohycheskykh kart na bliuda y kulynarnie yzdeleya dlia zavedenyi restorannoho khoziaistva. A.S.C, 1248. ISBN 978-966-319-140-9.
 13. Herzhukova V. G. (2009) Metody tekhnokhymycheskoho kontroliu v vynodely. Tavriada, vol. 2, 304. ISBN 978-966-584-194-4.
 14. Kovalenko, H. A., Vietrov, D. I. Reminna, L.P., Postol N. A. (2010). Vplyv tekhnolohii vodopidhotovky na yakist vody ta napoiv, vyhotovlenykh na yii osnovi. *Kharchova nauka i tekhnolohiia*, № 3(12), 73–76.
 15. Kovalenko, H. A., Bezusov, A. T., Vietrov, D. I., Postol N. A. (2011). Rozrobka tekhnolohii vodopidhotovky dlia vyrobnytstva chainykh napoiv. *Naukovi pratsi ONAKHT*, vol. 40, p. 2, 66–71.

REQUIREMENTS TO THE QUALITY OF TECHNOLOGICAL WATER FOR PREPARATION OF DRINKS ON THE BASIS OF RAW TEA (P 68 - 75)

Elena Kovalenko, Dmitry Vetrov, Vitalii Prybyl'skyi

The purpose of the scientific research, the results of which are given in the article, is development of requirements for the quality of technological water, which is used for preparation of tea drinks in establishments of restaurant industry. The object of research in the work is regularities of tea drinks quality changes during their preparation depending on a chemical composition of technological water.

The group of substances, dissolved in the technological water, and dissolved extractive materials of raw tea, from which quality of the drinks and their functional properties depends, have been defined as a result of scientific research work. Influence of concentration of dissolved substances of technological water on chemical and organoleptic indicators of tea drinks has also been studied. As a result of mathematical processing of experimental data the system of regression equations has been received. It allows to define the content of drinks prepared of raw tea. The content consists of polyphenolic substances, vitamin C, caffeine and organoleptic indicators depending on concentration of total hardness salts, total ferro, copper, free residual chlorine. It also allows to define the value of indicator of permanganate oxidability and dry residue in the technological water, used for their preparation. The main result of the work are requirements for the quality of technological water, used for preparation of drinks on the basis of raw tea in establishments of restaurant industry.

Keywords: black tea, green tea, model solutions, technological water, indicators of quality.

References

1. Cheung, T. (2011) World's 50 most delicious drinks. Retrieved from <http://travel.cnn.com/explorations/drink/worlds-50-most-delicious-drinks-883542>
2. Pauqin, P., (2009). Functional and Speciality Beverage Technology. Woodhead publishing in food science and technology, 512.
3. Yang, X. Q. (2003). The components and properties of tea polyphenols. *Tea polyphenol chemistry*, 1–54.
4. Bhagwat, S., Haytowitz, D., Holden, J. (2013). USDA Database for the Flavonoid Content of Selected Foods. *United States Department of Agriculture, Release 3.1*, 89–93.

