



**Universitatea Tehnică a Moldovei**

# **INFLUENȚA PROCESELOR TEHNOLOGICE ASUPRA CALITĂȚII PREPARATELOR CULINARE**

**Masterand:**

**BATIN Roman**

**Conducător:**

**dr.,conf. univ.  
CHIRSANOVA Aurica**

**Chișinău, 2020**

**MINISTERUL EDUCAȚIEI, CULTURII ȘI CERCETĂRII AL REPUBLICII  
MOLDOVA**

**Universitatea Tehnică a Moldovei  
Facultatea Tehnologia Alimentelor  
Departamentul Alimentație și Nutriție**

**Admis la susținere  
Șef departament:  
Chirsanova Aurica, conf. univ., dr.**

---

”\_\_\_\_\_” \_\_\_\_\_ 2020

## **Influența proceselor tehnologice asupra calității preparatelor culinare**

**Teză de master**

**Masterand: \_\_\_\_\_ BATIN Roman,  
MRSC-191 M**

**Conducător: \_\_\_\_\_ CHIRSANOVA Aurica,  
Dr., conf. univ.**

**Chișinău, 2020**

## REZUMAT

În cadrul tezei de master cu titlul „ **Influența proceselor tehnologice asupra calității preparatelor culinare**” a fost realizat un studiu bibliografic cu scopul de a scoate în evidență impactul pandemiei Covid 19 asupra sectorului alimentației publice și evidențierea unor tendințe actuale în domeniul. În partea experimentală a lucrării a fost studiat efectul diferitor tratamente termice printre care tratarea sous vide, fierberea, fierberea la abur, călirea și coacerea în rolă cu scopul aflării pierderilor tehnologice și comparării acestora. Rezultatele obținute și expuse în teză denotă că tratarea unui sortiment variat de legume, a trei tipuri de pește și a trei tipuri de piept de carne a diferitor păsări acționează în mod diferit asupra pierderilor. În rezultat s constată că tratarea sous vide nu numai că este o metodă modernă ce pe larg astăzi se promovează în unitățile de alimentație publică dar și asigură o valoarea nutritivă a produselor foarte bună și duce la obținerea unor pierderi tehnologice destul de mici.

## SOMMAIRE

Within the master's thesis entitled "The influence of technological processes on the quality of food" was conducted a bibliographic study in order to highlight the division of the Covid 19 pandemic on the food sector and highlight current trends in the field. In the experimental part of the paper was studied the effect of heat treatment, including vacuum treatment, boiling, steaming, hardening and baking in order to find out the technological losses and compare them. The results obtained and presented in the thesis show that the treatment of a varied assortment of vegetables, three types of fish and three types of meat breasts of birds acting differently acts on the catches. As a result, it is found that sous vide treatment is not only a modern method that is widely promoted in public catering establishments today but also ensures a very good nutritional value of products and leads to obtaining quite small technological advances.

## Lista bibliografica:

- 1.FAO, IFAD, UNICEF, WFP and WHO. The State of Food Security and Nutrition in the World. SOFI, 2019. <http://www.fao.org/3/ca5162en/ca5162en.pdf>.
2. Cadre Harmonisé Manual Version 2.0. Identification and analysis of areas at risk and populations affected by food and nutrition. CILSS. 2019. [https://www.fsinplatform.org/sites/default/files/resources/files/CH20-Manual\\_En\\_finalWeb.pdf](https://www.fsinplatform.org/sites/default/files/resources/files/CH20-Manual_En_finalWeb.pdf).
3. Global report on food crises. Joint analysis for better decisions. 2020. [https://docs.wfp.org/api/documents/WFP0000114546/download/?\\_ga=2.200662312.767086349.1596133798-742586042.1596133798](https://docs.wfp.org/api/documents/WFP0000114546/download/?_ga=2.200662312.767086349.1596133798-742586042.1596133798).
4. Coronavirus disease (COVID-19) advice for the public. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>.
5. Coronavirus disease (COVID-19) Situation Report – 192 Data as received by WHO from national authorities by 10:00 CEST, 30 July 2020. [https://www.who.int/docs/defaultsource/coronaviruse/situation-reports/20200730-covid-19-sitrep-192.pdf?sfvrsn=5e52901f\\_4](https://www.who.int/docs/defaultsource/coronaviruse/situation-reports/20200730-covid-19-sitrep-192.pdf?sfvrsn=5e52901f_4).
6. COVID-19 and food safety: guidance for food businesses. Aprilie, 2020. FAO & WHO. [accesat 03.08.2020]. Disponibil: <https://www.who.int/publications/i/item/covid-19-and-food-safety-guidance-for-foodbusinesses>.
7. Critical preparedness, readiness and response actions for COVID-19: Interim guidance 19 March 2020. <https://www.who.int/publications-detail/critical-preparedness-readinessand-response-actions-for-covid-19>
8. ILO Monitor: COVID-19 and the world of work. Second edition Updated estimates and analysis. [https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms\\_740877.pdf](https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_740877.pdf).
9. Scenario Development for Food Security Early Warning. FEWS NET. 2018. [https://fews.net/sites/default/files/documents/reports/Guidance\\_Document\\_Scenario\\_Development\\_2018.pdf](https://fews.net/sites/default/files/documents/reports/Guidance_Document_Scenario_Development_2018.pdf)
10. Huang R, Xia J, Chen Y, Shan C, Wu C. A family cluster of SARSCoV-2 infection involving 11 patients in Nanjing, China Lancet Infect Dis 2020 doi: 10.1016/ S1473-3099(20)30147-X.
11. Shrikrushna Subhash Unhale, Quazi Bilal. IMPACT OF COVID-19 ON FOOD SAFETY AND FOOD SECURITY. World Journal of Advance Healthcare Research Volume 4, Issue 3. 2020. ISSN 2457-0400.
12. Bartik, A. W. , Bertrand, M. , Cullen, Z. B. , Glaeser, E. L. , Luca, M. , & Stanton, C. T. (2020). How are small businesses adjusting to COVID-19? Early evidence from a survey (No. w26989) . National Bureau of Economic Research. [Google Scholar].
13. See OpenTable.com, “The state of the restaurant industry”. [accesat 03.08.2020]. Disponibil: <https://www.opentable.com/state-of-industry>.
14. Gössling, S. , Scott, D. , & Hall, C. M. (2020). Pandemics, tourism and global change: A rapid assessment of COVID-19. Journal of Sustainable Tourism , 1–20. <https://doi.org/10.1080/09669582.2020.1758708> [Taylor & Francis Online], [Web of Science ®], [Google Scholar].
15. Gursoy, D. , Chi, C. G. , & Chi, O. H. (2020). COVID-19 Study 2 Report: Restaurant and Hotel Industry: Restaurant and hotel customers’ sentiment analysis. Would they come back? If they would, WHEN? (Report No. 2), Carson College of Business, Washington State University. [Google Scholar].
16. UNWTO world tourism barometer (Vol. 18, Issue 2, May 2020) . [Google Scholar]. 94 R. Siminiuc, D. Țurcanu Journal of Social Sciences September, 2020, Vol. 3
17. See United States Department of Agriculture, Economic Research Service, “Average daily intake of food by food source and demographic characteristics, 2007-10”. [accesat 03.08.2020]. Disponibil: <https://www.ers.usda.gov/data-products/food-consumption-and-nutrient-intakes/>.

18. ILO (International Labour Organization) Sectoral Brief: COVID-19 and the impact on agriculture and food security. [accesat 03.08.2020]. Disponibil: [https://www.ilo.org/wcmsp5/groups/public/ed\\_dialogue/sector/documents/briefingnote/wcms\\_742023.pdf](https://www.ilo.org/wcmsp5/groups/public/ed_dialogue/sector/documents/briefingnote/wcms_742023.pdf).
19. Q&A on coronaviruses (COVID-19). [accesat 03.08.2020]. Disponibil: <https://www.who.int/news-room/q-adeTAIL/q-a-coronaviruses>.
20. Zoani, Claudia. Sistemi agroalimentari e impatto della pandemia da COVID-19. Divisione Biotecnologie e Agroindustria, ENEA 1/2020. In: Energia, ambiente e innovazione.
21. Galanakis, C.M. Food Security and Nutrition; Galanakis, C., Ed.; Elsevier-Academic Press: London, UK, 2019. ISBN 9780128209325.
22. Galanakis, C. Preface. In Proteins: Sustainable Source, Processing and Applications; Galanakis, C.M., Ed.; Elsevier Inc.: Waltham, MA, USA, 2019.
23. Galanakis, C.M. Food Quality and Shelf Life; Academic Press: London, UK, 2019; ISBN 9780128171912.
24. Siminiuc, R., Țurcanu D., The impact of the pandemic on the agri-food system. Journal of Social Sciences Vol. III, no. 3 (2020), pp. 85 – 94. DOI: 10.5281/zenodo.3971973
25. François Choain et Philippe Noël, *Le sous-vide et les technologies actuelles en cuisine*, Jacques Lanore (ISBN 978-2-86268-263-1 et 2-86268-263-2)
26. Georges Pralus, *LA CUISINE SOUS VIDE : une histoire d'amour*, Pouilly-sous-Charlieu, G. Pralus, 1985, 445 p. (ISBN 978-2-9501091-0-1 et 2-9501091-0-1)
- 27 Baldwin D.E (2012) *Sous vide cooking: A review*. International Journal of Gastronomy and Food Science, 1(1), 15-30
28. Annika Andersson, Ulf Rönner, and Per Einar Granum. What problems does the food industry have with the spore-forming pathogens *Bacillus cereus* and *Clostridium perfringens*? International Journal of Food Microbiology, 28:145–155, 1995.
29. Anon. Food code. Technical report, U.S. Department of Health and Human Services, 2005b.
30. Necla Aran. The effect of calcium and sodium lactates on growth from spores of *Bacillus cereus* and *Clostridium perfringens* in a ‘sous-vide’ beef goulash under temperature abuse. International Journal of Food Microbiology, 63:117–123, 2001.
31. Gillian A. Armstrong and Heather McIlveen. Effects of prolonged storage on the sensory quality and consumer acceptance of sous vide meat-based recipe dishes. Food Quality and Preference, 11:377–385, 2000.
32. P. Arvidsson, M. A. J. S. Van Boekel, K. Skog, and M. Jägerstad. Kinetics of formation of polar heterocyclic amines in a meat model system. Journal of Food Science, 62(5):911–916, 1997.
33. J. De Baerdemaeker and B. M. Nicolai. Equipment considerations for sous vide cooking. Food Control, 6(4): 229–236, 1995.
34. H.-D. Belitz, W. Grosch, and P. Schieberle. Food Chemistry. Springer, 3rd edition, 2004.
35. G. D. Betts and J. E. Gaze. Growth and heat resistance of psychrotropic *Clostridium botulinum* in relation to ‘sous vide’ products. Food Control, 6:57–63, 1995.
36. D. J. Bolton, C. M. McMahon, A. M. Doherty, J. J. Sheridan, D. A. McDowell, I. S. Blair, and D. Harrington. Thermal inactivation of *Listeria monocytogenes* and *Yersinia enterocolitica* in minced beef under laboratory conditions and in sous-vide prepared minced and solid beef cooked in a commercial retort. Journal of Applied Microbiology, 88:626–632, 2000.
37. P. E. Bouton and P. V. Harris. Changes in the tenderness of meat cooked at 50–65°C. Journal of Food Science, 46:475–478, 1981.
38. Ivor Church. The sensory quality, microbiological safety and shelf life of packaged foods. In Sue Ghazala, editor, *Sous Vide and Cook–Chill Processing for the Food Industry*, pages 190–205. Aspen Publishers, Gaithersburg, Maryland, 1998.
39. Ivor J. Church and Anthony L. Parsons. The sensory quality of chicken and potato products prepared using cook-chill and sous vide methods. International Journal of Food Science and Technology, 35:155–162, 2000.

40. Philip G. Creed. The sensory and nutritional quality of 'sous vide' foods. *Food Control*, 6(1):45–52, 1995.
41. Philip G. Creed. Sensory and nutritional aspects of sous vide processed foods. In Sue Ghazala, editor, *Sous Vide and Cook–Chill Processing for the Food Industry*, pages 57–88. Aspen Publishers, Gaithersburg, Maryland, 1998.
42. C. Lester Davey, Alan F. Niederer, and Arie E. Graafhuis. Effects of ageing and cooking on the tenderness of beef muscle. *Journal of the Science of Food and Agriculture*, 27:251–256, 1976.
43. Karl Mc Donald, Da-Wen Sun, and James G. Lyng. Effect of vacuum cooling on the thermophysical properties of a cooked beef product. *Journal of Food Engineering*, 52:167–176, 2002.
44. Peter Karim Ben Embarek and Hans Henrik Huss. Heat resistance of *Listeria monocytogenes* in vacuum packaged pasteurized fish fillets. *International Journal of Food Microbiology*, 20:85–95, 1993.
45. J. D. Fagan and T. R. Gormley. Effect of sous vide cooking, with freezing, on selected quality parameters of seven fish species in a range of sauces. *European Food Research and Technology*, 220:299–304, 2005.
46. Pablo S. Fernández and Michael W. Peck. A predictive model that describes the effect of prolonged heating at 70 to 90°C and subsequent incubation at refrigeration temperatures on growth from spores and toxigenesis by nonproteolytic *Clostridium botulinum* in the presence of lysozyme. *Applied and Environmental Microbiology*, 65(8):3449–3457, 1999.
47. M. C. García-Linares, E. Gonzalez-Fandos, M. C. García-Fernández, and M. T. García-Arias. Microbiological and nutritional quality of sous vide or traditionally processed fish: Influence of fat content. *Journal of Food Quality*, 27:371–387, 2004.
48. P. García-Segovia, A. Andrés-Bello, and J. Martínez-Monzó. Effect of cooking method on mechanical properties, color and structure of beef muscle (*M. pectoralis*). *Journal of Food Engineering*, 80:813–821, 2007.
49. A. H. Geeraerd, C. H. Herremans, and J. F. Van Impe. Structural model requirements to describe microbial inactivation during a mild heat treatment. *International Journal of Food Microbiology*, 59:185–209, 2000.
50. S. Ghazala, J. Aucoin, and T. Alkanani. Pasteurization effect on fatty acid stability in a sous vide product containing seal meat (*Phoca groenlandica*). *Journal of Food Science*, 61(3):520–523, 1996.
51. E. González-Fandos, M. C. García-Linares, A. Villarino-Rodríguez, M. T. García-Arias, and M. C. García-Fernández. Evaluation of the microbiological safety and sensory quality of rainbow trout (*Oncorhynchus mykiss*) processed by the sous vide method. *Food Microbiology*, 21:193–201, 2004.
52. E. González-Fandos, A. Villarino-Rodríguez, M. C. García-Linares, M. T. García-Arias, and M. C. García-Fernández. Microbiological safety and sensory characteristics of salmon slices processed by the sous vide method. *Food Control*, 16:77–85, 2005.
53. G. W. Gould. Sous vide food: Conclusions of an ECFF Botulinum working party. *Food Control*, 10:47–51, 1999.
54. N. Graiver, A. Pinotti, A. Califano, and N. Zaritzky. Diffusion of sodium chloride in pork tissue. *Journal of Food Engineering*, 77:910–918, 2006.
55. T. B. Hansen and S. Knøchel. Thermal inactivation of *Listeria monocytogenes* during rapid and slow heating in sous vide cooked beef. *Letters in Applied Microbiology*, 22:425–428, 1996.
56. Tina B. Hansen, Susanne Knøchel, Dorte Juncher, and Grete Bertelsen. Storage characteristics of sous vide cooked roast beef. *International Journal of Food Science and Technology*, 30:365–378, 1995.
57. Lihan Huang. Computer simulation of heat transfer during in-package pasteurization of beef frankfurters by hot water immersion. *Journal of Food Engineering*, 80:839–849, 2007.

58. M. Jägerstad, K. Skog, P. Arvidsson, and A. Solyakov. Chemistry, formation and occurrence of genotoxic heterocyclic amines identified in model systems and cooked foods. *Z Lebensm Unters Forsch A*, 207:419–427, 1998.
59. M. A. E. Johansson, L. Fredholm, I. Bjerne, and M. Jägerstad. Influence of frying fat on the formation of heterocyclic amines in fried beefburgers and pan residues. *Food and Chemical Toxicology*, 33(12):993–1004, 1995.
60. V. K. Juneja, B. S. Eblen, and G. M. Ransom. Thermal inactivation of *Salmonella* spp. in chicken broth, beef, pork, turkey, and chicken: Determination of d- and z-values. *Journal of Food Science*, 66:146–152, 2001.
61. M. Kent, K. Christiansen, I. A. van Haneghem, E. Holtz, M. J. Morley, P. Nesvadba, and K. P. Poulsen. COST 90 collaborative measurement of thermal properties of foods. *Journal of Food Engineering*, 3:117–150, 1984.
62. Anne Lassen, Morten Kall, Kirsten Hansen, and Lars Ovesen. A comparison of the retention of vitamins B1, B2 and B6, and cooking yield in pork loin with conventional and enhanced meal-service systems. *European Food Research and Technology*, 215:194–199, 2002.
63. Marek Markowski, Ireneusz Bialobrzeski, Marek Cierach, and Agnieszka Paulo. Determination of thermal diffusivity of lyoner type sausages during water bath cooking and cooling. *Journal of Food Engineering*, 65:591–598, 2004.
64. Harold McGee. *On Food and Cooking: The Science and Lore of The Kitchen*. Scribner, New York, 2004.
65. Lene Meinert, Annette Schäfer, Charlotte Bjerregaard, Margit D. Aaslyng, and Wender L. P. Bredie. Comparison of glucose, glucose 6-phosphate, ribose, and mannose as flavour precursors in pork; the effect of monosaccharide addition on flavour generation. *Meat Science*, 81:419–425, 2009.
66. Anne Meynier and Donald S. Mottram. The effect of pH on the formation of volatile compounds in meat-related model systems. *Food Chemistry*, 52:361–366, 1995.
67. Ban Mishu, J. Koehler, L.A. Lee, D. Rodrigue, F.H. Brenner, P. Blake, and R.V. Tauxe. Outbreaks of *Salmonella enteritidis* infections in the United States, 1985-1991. *Journal of Infectious Diseases*, 169:547–552, 1994.
68. D. A. A. Mossel and Corry B. Struijk. Public health implication of refrigerated pasteurized ('sous-vide') foods. *International Journal of Food Microbiology*, 13:187–206, 1991.
69. Donald S. Mottram. Flavour formation in meat and meat products: A review. *Food Chemistry*, 62(4):415–424, 1998.
70. National Advisory Committee on Microbiological Criteria for Food. Response to the questions posed by the food and drug administration and the national marine fisheries service regarding determination of cooking parameters for safe seafood for consumers. *Journal of Food Protection*, 71(6):1287–1308, 2008.
71. A. D. Neklyudov. Nutritive fibers of animal origin: Collagen and its fractions as essential components of new and useful food products. *Applied Biochemistry and Microbiology*, 39:229–238, 2003.
72. B. M. Nicolai and J. De Baerdemaeker. Sensitivity analysis with respect to the surface heat transfer coefficient as applied to thermal process calculations. *Journal of Food Engineering*, 28:21–33, 1996.
73. Hilda Nyati. An evaluation of the effect of storage and processing temperatures on the microbiological status of sous vide extended shelf-life products. *Food Control*, 11:471–476, 2000a.
74. Hilda Nyati. Survival characteristics and the applicability of predictive mathematical modelling to *Listeria monocytogenes* growth in sous vide products. *International Journal of Food Microbiology*, 56:123–132, 2000b.
75. Corliss A. O'Bryan, Philip G. Crandall, Elizabeth M. Martin, Carl L. Griffis, and Michael G. Johnson. Heat resistance of *Salmonella* spp., *Listeria monocytogenes*, *Escherichia coli* 0157:H7, and *Listeria innocua* M1, a potential surrogate for *Listeria monocytogenes*, in meat and poultry: A review. *Journal of Food Science*, 71 (3):R23–R30, 2006.



76. Fiach C. O'Mahony, Tomás C. O'Riordan, Natalia Papkovskaia, Vladimir I. Ogurtsov, Joe P. Kerry, and Dmitri B. Papkovsky. Assessment of oxygen levels in convenience-style muscle-based sous vide products through optical means and impact on shelf-life stability. *Packaging Technology and Science*, 17:225–234, 2004.
77. Michael W. Peck. Clostridium botulinum and the safety of refrigerated processed foods of extended durability. *Trends in Food Science & Technology*, 8:186–192, 1997.
78. Michael W. Peck and Sandra C. Stringer. The safety of pasteurised in-pack chilled meat products with respect to the foodborne botulism hazard. *Meat Science*, 70:461–475, 2005. Q. Tuan Pham. Modelling heat and mass transfer in frozen foods: a review. *International Journal of Refrigeration*, 29:876–888, 2006.
79. T. H. Powell, M. E. Dikeman, and M. C. Hunt. Tenderness and collagen composition of beef semitendinosus roasts cooked by conventional convective cooking and modeled, multi-stage, convective cooking. *Meat Science*, 55:421–425, 2000.
80. Joan Roca and Salvador Brugués. *Sous-Vide Cuisine*. Montagud Editores, S.A., 2005.
- Svetlana Rybka-Rodgers. Improvement of food safety design of cook-chill foods. *Food Research International*, 34:449–455, 2001.
81. Svetlana Rybka-Rodgers. Developing a HACCP plan for extended shelf-life cook-chill ready-to-eat meals. *Food Australia*, 51:430–433, 1999.
82. P. D. Sanz, M. D. Alonso, and R. H. Mascheroni. Thermophysical properties of meat products: General bibliography and experimental values. *Transactions of the ASAE*, 30:283–289 & 296, 1987.
83. Mia Schellekens. New research issues in sous-vide cooking. *Trends in Food Science and Technology*, 7: 256–262, 1996.
84. J. D. Schuman, B. W. Sheldon, J. M. Vandepopuliere, and H. R. Ball, Jr. Immersion heat treatments for inactivation of Salmonella enteritidis with intact eggs. *Journal of Applied Microbiology*, 83:438–444, 1997.
85. Calcatiniuc Dumitru, Grițco Cătălina, Chirsanova Aurica, Boiștean Alina, The impact of organic food on the Moldovan market, *International Scientific Conference on Microbial Biotechnology* 4th edition, Chisinau, Moldova, October 11-12, 2018, p.76 , ISBN 978-9975-3178-8-7 [https://ibn.idsi.md/sites/default/files/imag\\_file/76-76\\_1.pdf](https://ibn.idsi.md/sites/default/files/imag_file/76-76_1.pdf)
86. Chirsanova Aurica, Calcatiniuc. Dumitru. THE IMPACT OF FOOD WASTE AND WAYS TO MINIMIZE IT. *Journal of Social Sciences*. Vol. IV, no. 1, 2021, pp. 128 – 139 DOI: [https://doi.org/10.52326/jss.utm.2021.4\(1\).15](https://doi.org/10.52326/jss.utm.2021.4(1).15)
87. Chirsanova Aurica, Reșitca Vladislav. Factori de bază ce influențează politicile alimentare și nutriționale la nivel internațional. *Meredian ingineresc. Univestitatea Tehnică a Moldovei*. Nr.3, 2013, ISSN 1683-853X. p.86-92. [https://ibn.idsi.md/ro/vizualizare\\_articol/27531](https://ibn.idsi.md/ro/vizualizare_articol/27531)
88. CHIRSANOVA, A., Analiza senzorială a produselor lactate : Ciclul de prelegeri, Univ. Tehn. a Moldovei, Fac. Tehnol. și Manag. în Industria Alimentară, Cat. Tehnol. și Organiz. Alimentației Publice.- Ch.: U.T.M., 2009.
89. Ciurac J., Chirsanova A., Reșitca V. *Technologie culinaire*. ISBN 978-9975-87-563-9. 2020. CZU 641.5(075.8). Aporbat spre editare la Senatul UTM din 26.11.2019. 201 p
90. Managementul calității produselor alimentare : Indicații metodice / [elab.: Aurica Chirsanova, Alina Boiștean, Corina Cioban ; red. resp.: Aurica Chirsanova] ; Univ. Teh. a Mold., Fac. Tehnol. și Managem. în Ind. Aliment., Cat. Tehnol. și Organiz. Aliment. Publice. – Ch.: Tehnica – UTM, 2013. – 60 p.
91. Ciurac J., Reșitca V., Chirsanova A., Carcanari T, Boaghi E. *Общая технология пищевых производств*. Chișinău, Editura „Tehnică – UTM”, 2019. ISBN 978-9975-45-582-4. CZU 663/664(075.8), O-280. Coli de tipar 54,5.–435p.
92. Tehnologia produselor alimentației publice: Culegere de fișe tehnologice / Cristina Popovici, Olga Deseatnicova, Aurica Chirsanova; red. resp.: Cristina Popovici; Univ. Teh. a Mold., Fac. Tehnol. Alimentelor, Dep. Alimentație și Nutriție. – Ch.: Tehnica – UTM, 2017. – 88 p.



93. Ciurac J., Reșitca V., Chirsanova A., Capcanari T., Voaghi E. *Общая технология пищевых производств*. Chișinău, Editura „Tehnică – UTM”, 2019. ISBN 978-9975-45-582-4. CZU 663/664(075.8), O-280. Coli de tipar 54,5.–435p.
94. Vlădeș Natalia, Chirsanova Aurica *Biochimie structurale*, Universitatea Tehnică a Moldovei. Chișinău: Bons Offices, 2020. 116 p. ISBN: 978-9975-87-744-2.
95. Chirsanova Aurica, Capcanari Tatiana. *Prelucrarea sanitară în cadrul unităților de alimentație publică*. I N S T R U C Ț I U N I Chișinău 2018. ISBN 978-9975-45-559-6. CZU 613.6:663/664(083.13) C 45.
96. Chirsanova Aurica , Boistean Alina, Chiselită Natalia, Siminiuc Rodica. Impact of yeast sediment beta-glucans on the quality of yoghurt. *Food systems*. Federal Research Center for Food Systems of Russian Academy of Sciences. 2021; 4(1). p.12-18  
<https://doi.org/10.21323/2618-9771-2021-4-1-12-18>
97. Boistean Alina, Chirsanova Aurica, Ciurac Jorj, Gaina Boris. The particularities of the clarification process white wine vinegar. *Food systems*. Federal Research Center for Food Systems of Russian Academy of Sciences. 2020;3(1):25-32. <https://doi.org/10.21323/2618-9771-2020-3-1-25-32>
98. Boistean Alina, Chirsanova Aurica, Zgardan Dan, Mitina Irina, Gaina Boris. *METHODOLOGICAL ASPECTS OF REAL-TIME PCR USAGE IN ACETOBACTER DETECTION*. *Journal of Engineering Science*. Vol. XXVII, no. 3, 2020, pp. 232 – 238 categoria B+ DOI: <https://doi.org/10.5281/zenodo.3949726>
99. Chirsanova Aurica, Covaliov Eugenia, Tatiana Capcanari, Natalia Suhodol, Olga Deseatnicova, Boistean Alina, Resitca Vladislav, Sturza Rodica. Consumer behavior related to salt intake in Republic of Moldova. *Journal of social sciences*. Vol. III (4) 2020. CZU 366:613.2:664.41(478) pp.101-110. categoria B+ <https://doi.org/10.5281/zenodo.4296387>