

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY

Faculty of Food Technology

**METHODOLOGICAL INSTRUCTIONS FOR IMPLEMENTATION
QUALIFICATION MASTER'S THESIS**

field of knowledge: 18 "Production and technologies"
specialty: 181 "Food Technology"
education level

"Master of Food Technology"

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Introduction

Regulations on master's qualification work are part of the system of internal quality assurance of educational activities and quality of higher education in Sumy National Agrarian University (hereinafter - SNAU), regulates the organization of preparation and defense of final qualification work and developed taking into account the Law of Ukraine "On Higher Education" MES of Ukraine, the standard of higher education of Ukraine in the specialty 181 "Food Technology", "Regulations on the examination commission for certification of applicants for higher education in SNAU", as well as the SNAU experience gained by students of final qualification projects (works).

Qualifying master's thesis is a qualifying independent research performed by a student at the final stage of study at SNAU. The master's thesis is designed to objectively assess the degree of formation of knowledge and skills to solve professional problems, which are specified in the characteristics of the relevant educational and professional master's program, an integral part of which is research.

On the basis of the defense of the qualification work, the Examination Commission (EC) decides on the assignment of the appropriate qualification to the student and the issuance of a master's degree. In addition, during the defense of the master's thesis there is a demonstration by master's students of communication skills with the audience, the ability to formulate and express an opinion, correctly and confidently answer questions from the audience.

Qualifying master's thesis must have a practical reflection and internal unity and fully meet the goal of the chosen topic. On the one hand, the master's thesis is general in nature, as it is a kind of result of master's training; but on the other hand it is an independent original scientific and practical research of the student.

Thus, the implementation of a qualifying master's thesis, as the final stage of training in higher education aims to form a student's general and professional competencies provided by the educational program of master's training.

As a result of writing a qualifying work, the student will be able to demonstrate:

- ability to act socially consciously, show initiative and ingenuity;
- ability to find and analyze the necessary information in the scientific and technical literature, electronic databases, choose innovative areas of research taking into account economics and marketing;
- ability to use special equipment, methods and techniques during scientific research and in production;
- choose the most promising and rational areas of scientific and technical activities, the ability to conduct research, analyze the results and draw conclusions, reproduce the results of scientific research and testing in the

production conditions of real enterprises;

- ability to develop new food products, culinary products and improve existing ones, conduct research and optimize technological processes;
- ability to organize production and implement scientific and technical projects taking into account current trends in the food industry;
- ability to organize a system of quality control and safety of food raw materials, semi-finished products and food products;
- ability to communicate and present the results to the audience and discuss them, prepare scientific publications, security documents.

Qualifying master's thesis must meet the requirements:

- focus of all developments on the disclosure of the topic and tasks relevant to the agro-industrial complex and processing industry;
- compliance with real production conditions;
- clarity of structure and logic of teaching the material;
- conciseness and persuasiveness of arguments and conclusions;
- validity and generalization of theoretical and practical recommendations for production.

The specific objectives of the master 's thesis depend on its orientation (practical, research) and the object of research. The task may be to search for and substantiate new technologies, improve existing processes, create and use new food samples, in-depth study of theoretical models, mastering the methodology, techniques and modern tools of research.

Qualifying master's thesis should be performed taking into account modern theoretical and practical domestic and foreign experience. The research performed by the master can be a continuation of the scientific and practical work of the student, started in previous courses and find its further development in the implementation of the candidate's dissertation, and can also be implemented in existing enterprises.

The master's thesis is made out by the state movement as a manuscript in the amount of 50... 70 pages of typewritten text in A4 format with the presented images and tables of results of experimental researches, depending on researches. It should not be copied from textbooks or manuals of theoretical provisions, methods of others, as well as possible links to them. Responsibility for the accuracy of the initial, calculated and accepted in the master's thesis data is given to students - the author of the work. The supervisor helps the student to create, determine and make the right decision, check and evaluate the decision.

The recommended component of the master's thesis is the preparation of the publication of articles and abstracts based on the results of scientific research

The head of the final qualification work is appointed by the teacher of the department, who has a scientific degree of doctor or candidate of sciences, academic title and conducts scientific research in the relevant field.

1. ORGANIZATIONAL ARRANGEMENTS FOR THE MASTER'S THESIS

1.1. Topics of master's work

The first stage in writing a master's thesis is the choice of research topic. The topic should be relevant, be practically significant, have a research character and reflect the important problems of food technology. Choosing and formulating a topic correctly means:

- The unmistakably determine its relevance and expediency, novelty and viability;

- The take into account the availability of a theoretical basis, the possibility of performing experimental research and the possibility of obtaining significant socio-economic results.

For this purpose it is necessary to carry out independent search of the information at the expense of acquaintance with information sources (about 45... 100 literary sources):

- articles in professional journals, collections of scientific papers, periodicals,

- abstracts of dissertations,

- textbooks and manuals,

- monographs,

- patents,

- Internet resources, in particular information from professional technology forums, exhibitions, information from domestic and foreign research institutes, restaurants and the food industry, etc

The choice of the topic of the master's thesis, as well as any research work, includes several general approaches, in particular:

- study of the topics of scientific plans and programs of the graduating department;

- acquaintance with catalogs of previous defended diploma theses, dissertations, monographs, articles on the chosen topic

- evaluation of known scientific and production solutions using classical and new research methods or from the standpoint of traditional or new theoretical knowledge.

Topics of master's theses in the specialty 181 "Food Technology" are selected from the recommended list or independently in consultation with the supervisor.

The student has the right to choose the topic of the master's thesis in

accordance with the subject approved by the graduating department. In addition, master's theses can be performed on topics that will be commissioned by government agencies, enterprises and business structures. The student in coordination with the head can offer the subject of research under the conditions of the corresponding substantiation of expediency of its development (according to the previous own research work, a place of work, possibilities of reception of the necessary information on object of research).

As a rule, topics are related to: improvement or development of new technologies of food products (dishes) due to modifications of the prescription composition and application of various technological methods of influencing the process; research of organoleptic, physicochemical, structural-mechanical, technological properties of food; study of nutritional and biological value of the developed product, etc.

The topic of the qualifying master's thesis should include the solution of economic, organizational and social issues related to a particular area of research, taking into account the real possibility of obtaining technologically new products. The solution of the set tasks can be reached by creation of essentially new technologies, improvement of traditional technologies, revealing of objective tendencies of development of biological, chemical and mechanical processes which occur during manufacturing of concrete products.

It is desirable that the work be performed on the basis (or to order) of the interested enterprise or organization, so that its results become practical.

After processing the sources, the student draws up a plan, which is agreed with the supervisor, head of the educational and professional program, consultant, head of the graduating department and the dean.

The detailed plan is indicated in the task for the final qualification work (further - Tasks - an example is given in appendix. B), which, with the consent of the supervisor, may be adjusted. Relevant records are made about this in the approved version.

An example of the design of the title page of the qualifying master's thesis is given in dod. IN.

After choosing the topic of the qualification work, the supervisor together with the student develop deployed individual work plan for its practical implementation. This plan regulates the sequence and timing of work on individual stages of writing a master's thesis and includes a working curriculum with professional practice, as well as a plan that records the sequence and content of sections and sections of the qualification work.

The subject of qualification works and terms of their performance are determined at the beginning of the academic year in the master's program. The student independently chooses the topic of work, with the obligatory definition of the subject of research and its relevance, formulates it in the application

(Appendix A). The chosen topic is approved by the head of the department, who appoints a master's supervisor.

1.2. The main stages of the master's thesis

1. Choice of topic and object of study.
2. Obtaining a task for a master's thesis, drawing up a calendar plan for its implementation.
3. Elaboration of educational and scientific literature, choice of the problem and drawing up a detailed work plan.
4. Preparation for research: drawing up a program and research plan, selection of research methods, mastering research methods.
5. Conducting research.
6. Processing of actual material using a PC.
7. Writing the first version of the text, submitting it to the head.
8. Elimination of shortcomings, writing the final version of the text, registration of a master's thesis.
9. Submission of work for acquaintance to the head, receiving feedback.
10. Preliminary defense of master's thesis at the department.
11. Check for plagiarism.
12. External review of work.
13. Defense of master's thesis at the meeting of the examination commission (EC).

For the period of master's work at the department the schedule of consultations of the scientific adviser according to which systematic cooperation of the student and the head over the master's work is provided is made. Systematic consultations help the student in choosing research methods, in monitoring compliance with the requirements for the content and design of work, in the timely elimination of deviations. Prompt and careful implementation of the supervisor's recommendations facilitates the timely submission of the master's thesis for review and is the key to its successful defense.

Violation of the student's schedule of master's work is recorded by the head, who informs the head of the department.

1.3. Organization of master's thesis

The term of the master's thesis is determined by the schedule of the educational process.

The master's thesis must be performed by the student in full accordance with the approved calendar plan and tasks. In cases of lag behind the schedule, the student is obliged to give an explanation to his head or head of the department

In case of a positive review of the supervisor, the work is registered at the department and submitted to the head of the department, who must decide on the admission of the student to the defense of the work at a meeting of the EC.

The student then submits the work for plagiarism to the Department of Quality Assurance in Higher Education. After all the necessary preliminary procedures at the department, obtaining positive test results, the master's thesis is submitted for review. The list of reviewers is compiled at the department and approved by the dean of the faculty in the prescribed manner

In addition, before submitting a qualifying work for defense, it is submitted for plagiarism to the Department of Quality Assurance in Higher Education.

2. CONTENT AND SCOPE OF MASTER'S WORK

2.1. The structure of the master's thesis

The master's thesis should have a volume of 50-70 pages of text.

The content of the master's thesis is determined by its topic and is reflected in the plan developed with the help of a supervisor. According to the chosen topic, the student independently or on the recommendation of the supervisor selects literature sources and relevant regulations and drafts a plan, which he discusses with the supervisor.

The task for the master's thesis (Appendix B) in general determines the content of the work and contains in the main part the following sections:

- the name of the topic of work;
- summary of text and graphic parts of the work (software);
- initial data for research design.

At the same time the calendar plan of performance of work is made (appendix B)

Regardless of the profile of the specialty, the explanatory note to the master's thesis must contain the following mandatory structural elements:

- title page with the signatures of the student, supervisor, reviewer and be approved by the head of the graduating department;
- the task for the qualifying master's work, approved by the head of the graduating department and signed by the student, the head, consultants from separate sections of work;
- annotation in the state language and one of the languages of international communication (summary of the work with a total volume of not more than 150 words);
- list of abbreviations (if necessary) in alphabetical order;
- introduction (relevance, purpose, tasks, object and subject of research, research methods, scientific novelty of the obtained results and their practical significance, publications (if any) and personal contribution of the student, if published scientific works (or received positive decisions and patents) for the

invention) on the theme of the work performed in co-authorship;

- literature review;
- technical and economic substantiation and scientific and technical substantiation (if necessary) and selection of optimal variants of mathematical models of object and subject and research methods, etc .;
- sections of the main part, the content and list of which is determined by the profile of the specialty and the topic of the master's work, and the requirements for them are specified by the graduating department in the guidelines for master's work in the specialty;
- section of the economic part, which should contain the calculation of development efficiency, calculation of costs for exploratory design work, production of prototypes, etc .;
- conclusions, which formulate the main results of the work, the results obtained, prospects and directions for further research, etc .;
- list of used literature, in which the names of used literature sources, patents, regulatory and technical documents, addresses of Internet sites, etc. are placed in the order of references in the text of the software or in alphabetical order;
- applications (tables, various schemes, etc.).

The graphic part of the master's thesis contains all the required materials specified in the task, as well as additional illustrative materials (slides, posters), made to facilitate protection (the number is not regulated, but they do not replace mandatory schemes and other illustrations).

The graphic part of the master's thesis is designed in accordance with the requirements of current standards.

2.2. Requirements for registration of master's work

The work must be executed in accordance with the State Standard of Ukraine DSTU 3008-95 "Documentation. Reports in the field of science and technology. Structure and rules of registration "and" Methodical instructions on registration of course and qualification works "[72]. Given the high requirements of regulations, it is necessary to strictly follow the procedure for submitting certain types of textual material, tables, formulas and illustrations

The master's thesis is printed on one side of a sheet of white A4 paper, font - TimesNewRoman (for highlighting examples, concepts, etc., other fonts are allowed), font size - 14, line spacing 1.5 spacing (up to 30 lines per page), top and bottom field -20 mm, left - 30 mm, right - 10 mm.

The print font must be clear. The density of the text should be the same. It is possible to enter in it separate foreign words, formulas, conditional marks in black ink only.

Each formula is written from a new line, symmetrically to the text. One line

is skipped between the formula and the text. Symbols (symbols) in the formula are given in the text or immediately below the formula. To do this, after the formula put a comma and write an explanation of each character on a new line in the order in which they are given in the formula, separated by a semicolon. The first line should begin with a paragraph with the word "where" and without any sign after it. All formulas are numbered within the section in Arabic numerals. The number is indicated in parentheses on the right side, at the end of the line, at the end of the formula. The formula number consists of a section number and a sequence number of the formula in the section, separated by a period. It is allowed to perform numbering within the entire document

The text of the main part of the work is divided into sections, subsections, paragraphs, sub-paragraphs. Titles of structural parts of the work: **TABLE OF CONTENTS, INTRODUCTION, SECTION, CONCLUSIONS, LIST OF SOURCES USED, APPENDICES** are printed in capital letters symmetrically to the text in bold

Headings of the structural part (sections) are also printed in capital letters symmetrically to the text in bold. Headings of subdivisions are printed in small letters (except the first capital letter) from the paragraph in bold. Do not put a period at the end of the title. The headings of the paragraphs are printed in small letters (except for the first capital letter) from the paragraph. A full stop is placed at the end of the title. The distance between the title (except for the title of the paragraph) and the text should be 3-4 intervals (2 entries).

Each structural part of the master's thesis should start on a new page.

The total volume of the master's thesis does not include appendices, a list of used sources, tables and figures, which completely occupy the area of the page. At the same time, all pages of these elements of work are subject to numbering.

Illustrative material for the defense of the master's thesis can be made in the form of posters, drawings and presented using overheads (light projectors) and computer tools. The content of the illustrative material must sufficiently reflect the main provisions that are submitted for defense.

All pages of the master's thesis are subject to numbering on a general basis.

The numbering of pages, sections, subsections, paragraphs, sub-paragraphs, figures, tables, formulas is given in Arabic numerals without the sign №.

The page number is not placed on the title page, on the following pages the number is placed in the upper right corner of the page without a dot at the end.

The section number is placed after the word "SECTION", a full stop is not placed after the number, then the title of the section is printed from a new line.

Subsections are numbered within each section. The subdivision number consists of the section number and the serial number of the subdivision, between which a full stop is placed. At the end of the subsection number, a full stop is not

placed, for example: "2.3" (the third subsection of the second section). Then in the same line is the title of the unit.

Items are numbered within each unit. The item number consists of ordinal numbers of section, subsection, item, between which a full stop is placed. At the end of the number a full stop is not placed, for example: "1.3.2" (the second paragraph of the third subsection of the first section). Then in the same line is the title of the item. The item may not have a title. In the absence of a title at the end of the number put a full stop

Subparagraphs are numbered within each paragraph according to the same rules as paragraphs

Illustrations (photographs, drawings, diagrams, graphs, maps) and tables must be submitted immediately after the text where they are mentioned for the first time, or on the next page.

Illustrations are denoted by the word "Fig." and numbered sequentially within the section, except for the illustrations given in the appendices. If there is one drawing in the work, it is numbered according to the general rules

The illustration number must consist of a section number and the sequence number of the illustration, between which a full stop is placed. The number of the illustration, its title and explanatory captions are mixed sequentially under the illustration. The tables are numbered sequentially (except for the tables given in the appendices) within the section. In the upper left corner before the corresponding title of the table stir the inscription "Table" with the indication of its number.

The table number must consist of a section number and a sequence number of the table, between which a period is placed, followed by a dash table number, for example: "Table 1.2 -". If there is one table in the work, it is numbered according to the general rules.

When transferring part of the table to another page the word "Table" and its number indicate once on the left above the first part of the table, above the other parts write the words "Continuation of the table." and indicate the table number, for example, "Continue. table. 1.2 ».

Formulas are numbered within a section. The formula number consists of the section number and the ordinal number of the formula in the section, between which a full stop is placed. The formula numbers are written next to the right margin of the sheet at the level of the corresponding formula in parentheses, for example: (3.1) (the first formula of the third section).

2.3. Requirements for the design of the main structural elements of the master's thesis

Title page

The first page of the work is designed in accordance with the requirements of state standards for library and publishing. The title page (Appendix B) must contain the following details:

- The name of the educational institution;
- The name of the faculty and department;
- The topic of the master's thesis;
- The last name, first name, patronymic of the author;
- The course and number of his group;
- The last name, initials, academic degree and title of supervisor;
- The place and year of master's thesis.

Task

The task for the master's thesis contains: the topic of the master's thesis, deadlines, initial data for the work and the content of the explanatory note. An example of the task is given in the appendices (Appendix B).

Summary

The annotation, which has a volume of approximately 800 characters, indicates the name and initials of the applicant, the title of the qualification work, the main content and results of the study, keywords (words of specific terminology on the topic, which are most common in the qualifying work) are given in the nominative case. Number of keywords - 5-7.

The abstract must be written in Ukrainian, Russian and one of the foreign languages (usually English).

WITHbridge

The content (actually a working individual plan) is submitted at the beginning of the master's thesis. It contains the names and numbers of the starting pages of all sections, subsections and paragraphs, including the introduction, conclusions to the sections, general conclusions, appendices, list of references, etc. That is, is a list of sequentially composed activities that reveal the content of the topic; it should be made detailed and detailed. The work plan consists of sections, the names and sequence of which should reflect the structure of the research topic; move from general issues to more specific ones. This is the structure of each subsequent section. In the process of performing the master's thesis, the content can be adjusted (with the consent of the supervisor).

Perelik abbreviations and symbols

If specific terminology is used in the work, as well as little-known abbreviations, new symbols, symbols, etc. are used, then their list can be presented in the work in the form of a separate list, which is placed before the introduction.

The list should be printed in two columns, in which the left alphabet is given, for example, abbreviations, and on the right - a detailed transcript.

If in the work special terms, abbreviations, symbols, symbols and so on are repeated less than three times, the list is not made, and their decipherment is given in the text at the first mention.

Introduction

The volume of the introduction is 4... 6 pages and it reflects the relevance and appropriateness of the selected topic.

The introduction reveals the essence and state of the scientific or scientific-practical problem (task) and its significance, the grounds and initial data for the development of the topic, the justification of the need for research.

The following is a general description of the final work in the sequence recommended below.

Actuality of theme. By critical analysis and comparison with known solutions to the problem (scientific problem), substantiate the relevance and feasibility of work for the development of knowledge 18 "Production and Technology", especially in favor of Ukraine. Coverage of relevance should be concise and emphasize the essence of the problem.

Connection of work with scientific programs, plans, themes. The connection of the chosen direction of research with the plans of the organization where the work is performed, as well as with the branch and (or) state plans and programs is briefly stated.

The purpose and objectives of the study. Formulate the purpose of work and tasks that need to be solved to achieve this goal. The goal should not be formulated as "Research ...", "Study ...", because these words indicate the means to an end, not the goal itself.

Object of study. It is a process or phenomenon that creates a problem situation and is selected for study (for example, the technology of jelly sweet dishes).

The subject of research master's thesis is the laws of functioning and development of the object, its various qualities, properties, etc. The subject of research is located within the object.

Object and subject as categories of scientific process are correlated as general and partial. Example of a subject: technology of lemon jelly with the use of furcellaran.

Scientific novelty of the obtained results - one of the main requirements for the topic of work. It must contain solutions to a new scientific problem or new developments that expand the existing boundaries of knowledge in a particular field of science.

Provide a brief annotation of new scientific or practical provisions

(solutions) proposed by the student personally. It is necessary to show the difference between the obtained results and the previously known ones, to describe the degree of novelty (first obtained, improved, further developed)

The novelty of the work and the theme are organically connected. Novelty can be associated with old ideas, which is expressed in their deepening, concretization, additional argumentation, showing possible use in new conditions, in other areas of knowledge and practice, and with new ideas put forward personally by the applicant.

Publications. Indicate publications on the topic of work, if any

The main part (sections)

The content and results of research should be presented logically with reference to the publications of scientists (if necessary) and to avoid unsubstantiated allegations. In order for the master's thesis to acquire a logical sequence and system, its main part is divided into sections, subsections, paragraphs and sub-paragraphs. Yes, sections usually include:

-The subdivisions (numbering consists of two numbers separated by a period),

-The items (numbering - from three numbers),

-The sub-items (numbering - from four numbers).

IN conclusions

After the main part of the master's thesis, general conclusions are formed, the volume of which should not exceed 1.5... 2 pages. Of course, conclusions must be drawn for each section of the master's thesis (generalized results of a specific open question).

The general conclusions set out the most important scientific and practical results obtained during the master's thesis, which should contain the formulation of the solved scientific problem, its significance for science and practice, answers to the tasks.

Pposition

It is desirable to offer recommendations for scientific and practical use of the obtained results. It is worth emphasizing the possibility of implementing the results of their own research work in production.

WITH squeak of used sources

When writing a paper, the master must refer to the authors and sources from which he borrowed materials or individual results.

The list of used sources can be placed in one of the following ways:

– in the order in which the links appear in the text,

- in alphabetical order of the names of the first authors or titles,
- in chronological order.

Bibliographic description of sources is made in accordance with current standards in library and publishing. The bibliographic description of the list of used sources can be made according to one of the styles carried to the recommended list of the international styles of registration of publications or DSTU GOST 7.1: 2006 «System of standards on information, library and publishing. Bibliographic record, bibliographic description. General requirements and rules of assembly ».

Dextras

After the bibliographic list, the master's thesis contains appendices. Appendices include supporting material necessary for the completeness of the perception of the work. They are made in the form of technological schemes, tables, diagrams, graphs, figures, etc.

If applications are designed on subsequent pages of work, each such application must start on a new page. The application should have a title printed in small letters at the top with the first capital symmetrically relative to the text of the page. In the middle of the line above the title in small letters with the first capital letter is printed the word "Appendix" and a capital letter denoting the appendix.

Appendices should be marked consecutively with capital letters of the Ukrainian alphabet, except for letters І, Yes, WITH, I, Ї, Ў, О, Ч, Ъ, for example, Annex A, Annex B, etc. One appendix is referred to as Appendix A.

Illustrations, tables and formulas that are placed in the appendices are numbered within each appendix.

3. PROCEDURE FOR PROTECTION OF MASTER'S THESES

3.1. Providing a master's thesis to the department

Properly executed master's thesis is submitted to the department and supervisor for verification.

The master's thesis is prepared in the state language and must be submitted in a hardcover.

The master's thesis is signed by the author, heads of individual sections of the work (subject to the recommendations of the department), supervisor and head of the department.

Master's thesis in electronic and printed and stitched form remains at the department.

According to the calendar plan, the student must submit the work in parts

for review, and within the deadline set by the schedule submits the completed master's thesis for review to the supervisor.

In case of a positive review of the supervisor, the work is registered at the department and submitted to the head of the department, who must decide on the admission of the student to the defense of the work at a meeting of the EC.

The master's thesis must be peer-reviewed. Reviewing is entrusted to highly qualified specialists (teachers and scientists) of SNAU (internal reviewing), leading specialists of production, research and design organizations (external reviewing). The composition of reviewers is approved by order of the head of the department.

The review from the enterprise (institution, organization), on the materials of which the research was conducted, is certified by the signature of its head and the appropriate seal. This document is necessary to confirm the authenticity of the materials provided in the final qualification work on the activities of the enterprise-object of study.

When reviewing the final qualifying work, it is recommended to determine:

- the novelty of the formulation and development of the problem;
- use of scientific research methods;
- argumentation of conclusions and validity of proposals;
- the ability of the applicant for a master's degree, clearly, competently and reasonably to present the material, to design it correctly;
- shortcomings and comments on the content of the work, its design;
- conclusion on the possibility of admission to the defense.

The review is provided in writing and contains a general opinion on the recommendation for defense, indicating the assessment according to the accepted scale of assessment of knowledge in SNAU.

In order to determine the quality and degree of readiness to defend the final qualifying work, the graduating department organizes its preliminary defense with the obligatory presentation of the main provisions by the student.

Preliminary defense of the final qualifying work takes place with the involvement of specialized specialists of the department, with the participation of the head of the educational and professional program, and is regulated by the order of the department with the presentation of the schedule, which is communicated to the student.

The commission makes the generalized conclusion on readiness of final qualifying work for protection about what puts the corresponding mark in the individual plan on performance of final qualifying work.

After successful completion of the preliminary defense, the final qualifying work is submitted for consideration to the head of the department, who makes a conclusion on its recommendation for defense at a meeting of the EC.

Students whose final qualification works on the preliminary defense and

consideration by the head of the graduating department were evaluated positively, are allowed by the dean to defend at the EC meeting no later than 5 days before its work (according to the "Regulations on the examination commission for certification of higher education SNAU »). At the same time, the student submits to the department bound final qualifying work.

In case of formal discrepancies, including in the wording of the topic, the name of the enterprise (organization), on the materials of which the study was performed, etc., the final qualifying work is not registered, not accepted for review and not allowed for defense.

The student has no right to make changes to the master's thesis after its registration.

The title page of the presented work contains the signatures of: student, supervisor, head of the relevant educational and professional program, scientific consultant

3.2. Defense of master's thesis

The defense of the master's thesis takes place in the presence of a designated examination board with the obligatory use of electronic means (for example, PowerPoint).

The student prepares a speech for 10-12 minutes using the necessary illustrative material - a visual illustration of the relevant statements during the report - the content and quality of which is checked by the supervisor. The number of copies of illustrative material should correspond to the quantitative composition of the EC. An example of the title page of the illustrative material is given in appendix. G.

General provisions for writing a report

Preparation of a quality report ensures the success of the general preparation for the defense of the final qualification work. The report should contain a summary of the main results on the topic of the thesis and conclusions.

The general purpose of the report is not just to read the prepared text, but to convey and disclose scientific results based on the work done. The speaker's speech should show the importance and value of the work done, the relevance of the chosen topic and reflect the personal contribution to solving the tasks.

In defense, members of the examination commission (EC) assess, first of all, the degree of readiness of the student to defend the final qualifying work, and pay attention to the following:

- relevance of work, compliance of conclusions with the set task;
- the content of the main part of the qualification work,
- adequacy and relevance of the information provided in the handout.

- feedback from the supervisor (pros and cons);
- review (positive aspects and shortcomings of the work);
- compliance with the requirements of design, use of scientific style in writing the work;
- drawing up a list of used sources of work

The report for the defense of the qualification work should contain 3 main blocks: - introduction and formulation of the problem, determining its relevance; - the main part - the results of work performed; - approbation of results, conclusions and recommendations

The structure of the report should include:

- greetings; - relevance of the topic;
- purpose, tasks, object, subjects;
- organization of research;
- characteristics of the technological scheme of the dish (product)
- analogue;
- modeling of technological process;
- characteristics of quality indicators of new raw materials;
- *the results of research on a given topic (physico-chemical, structural-mechanical, functional-technological indicators of new raw materials and finished product);*
- *substantiation of the prescription composition and technological parameters of the process of production of new food products;*
- *results of assessment of nutritional, biological value and caloric content of food products;*
- *analysis of dangerous factors in the production of this product;*
- *assessment of economic efficiency of innovative product production;*
- *list of scientific publications on the topic of work;*
- *conclusions;*
- *end of the report.*

Based on the results of the defense and taking into account the feedback of the supervisor and reviewer, the examination commission issues a grade.

3.3. General criteria for evaluating a master's thesis

During the final qualifying work the student demonstrates: the ability to logically and argumentatively present the material, correctly use analytical, statistical, mathematical and other methods of scientific research, to conduct experiments; possession of generalization skills, formulation of conclusions; ability to work with literary sources.

Based on the results of the positive defense, the student is given a

differentiated grade on a 5 and 100 point scale. Criteria for evaluating the qualifying master's thesis and its defense are presented in (Table 3.1; 3.2).

Table 3.1 - Distribution of points for individual stages and elements of qualification (master's) work

№ s / n	Criteria for evaluating the performance of qualification works	Bali
1	The correct wording of the object, purpose and objectives of the study.	to 2
2	Correspondence of the content of work to its theme, literacy of structuring of work, balance of its sections.	to 7
3	Systematic presentation of the material, no repetitions, logical errors.	to 7
4	Degree of independence of work (absence of academic plagiarism), presence of links.	to 10
5	Use and mastery of modern literature, current regulations; correctness of calculations, application of methods of economic, statistical analysis, etc.	to 10
6	Theoretical validity of the main provisions of the qualification work, which are confirmed by selected and systematized factual and statistical material.	to 10
7	Correctness of registration (works as a whole, tables, figures, links, the list of the used sources)	to 7
8	Adherence to the schedule of work preparation, periodicity of consultation with the scientific adviser, etc.	to 7
	Together	Not more than 60

Table 3.2 - Criteria for evaluation by the commission of the level of protection of qualification (master's) work

Scores	The level of knowledge of the applicant for higher education	Evaluation criteria
36 - 40	high	The report of the applicant was well thought out, structured, contained the main results of the study, the applicant demonstrated fluency in the material on the research topic, answers to questions of the commission members are complete, deep understanding of the material, basic skills formed and mastered, logical presentation, evidence (discussion).

), conclusions and generalizations are accurate, the applicant is guided in the system of current legislation, the use of professional terminology is correct, the conclusions of the study are demonstrated using illustrative material (calculations).
32-36	sufficient	The report of the applicant is well thought out, substantiated, contains the main results of the study, the answers to the questions of the commission members are sufficient, the understanding of the material is deep, the basic skills are formed and mastered, conclusions and generalizations are accurate; the applicant of higher education is guided in the system of the current legislation; the use of professional terminology is correct, the conclusions of the study are demonstrated using illustrative material (calculations).
30-32		The report of the applicant is well thought out, substantiated, contains the main results of the study, the answers to the questions of the commission members are complete, the understanding of the material is deep enough, the basic skills are formed and mastered, conclusions and generalizations are accurate; the applicant of higher education is guided in the system of the current legislation; the use of professional terminology is correct. But the statement is not systematized enough, in the definition of concepts, terminology and generalizations there are some mistakes that are corrected by additional questions of commission members, some conclusions of the qualification work are not reflected in the defense, some conclusions are not demonstrated by illustrative material (calculations)
27-30	середній	The report of the applicant for higher education is not properly systematized, ill-considered, the main results of the study are partially disclosed, the answers to the questions of the commission members are unfounded, the understanding of the material is superficial; the applicant of higher education is poorly oriented in the system of current legislation; use of professional terminology with inaccuracies, some conclusions based on the results of the study are not demonstrated with the help of illustrative material (calculations).
24-27		The report of the higher education applicant is not properly systematized, ill-considered, the main results of the study are partially disclosed, the answers to the questions of the commission members are unfounded, the understanding of the material is

		superficial; the applicant for higher education is not oriented in the system of current legislation; use of professional terminology with inaccuracies. Conclusions and proposals are insufficiently substantiated and have a dubious applied nature, the conclusions of the study are not demonstrated by illustrative material (calculations).
14-24	low	The report of the higher education applicant is not properly prepared, the answers to the questions of the commission members are unfounded or absent, the understanding of the material is superficial; the applicant for higher education is not oriented in the system of current legislation; does not know how to use professional terminology. The work testifies to the insufficient formation of basic professional skills, there is no substantiation of the practical and applied value of the research, the conclusions based on the research results are not demonstrated with the help of illustrative material (calculations).
0-14		The report of the applicant is not prepared, the answers to the questions of the commission members are unfounded or absent, the understanding of the material is superficial; the applicant for higher education is not oriented in the system of current legislation; does not know how to use professional terminology. The work shows the lack of basic professional skills, some conclusions based on the results of the study are not demonstrated with the help of illustrative material (calculations).

4. PRACTICAL RECOMMENDATIONS FOR WRITING SEPARATE SECTIONS OF THE QUALIFYING MASTER'S THESIS

This section discusses in detail the approaches and recommendations for writing individual sections of the master's thesis. Typical tables and calculations are provided, but all of them can be adjusted and completely changed taking into account the peculiarities of the topic of work.

The main part is represented by the following sections:

Section I "REVIEW OF LITERATURE ON SELECTED TOPICS" (monitoring of current trends in production on the topic of work, theoretical justification of relevance, conclusions on ensuring the target functions of the body and prospects for further research);

Section II "ORGANIZATION, OBJECT, SUBJECTS AND METHODS OF RESEARCH" (choice of research scheme, indication of the object and

methods of research);

Section III "RESULTS OF EXPERIMENTAL RESEARCH, JUSTIFICATION OF THE COMPOSITION OF THE PRODUCT, TECHNOLOGY, OPTIMIZATION OF TECHNOLOGICAL SOLUTIONS FOR FOOD PRODUCTION » (experimental part with analysis and generalization of research results);

Section IV "ANALYSIS OF TECHNOLOGY AND DETERMINATION OF DANGEROUS FACTORS OF FOOD PRODUCTION";

Section V "CALCULATION OF THE EXPECTED ECONOMIC EFFECT FROM THE INTRODUCTION OF A NEW PRODUCT".

4.1. Literature review on selected topics (SECTION 1)

Literature review is a written work that contains a summary of the state of the selected technological issue, necessary and sufficient for understanding by experts in this field. In general, the literature review has a specific purpose (orientation of specialists in the information flow), is characterized by specific compositional and stylistic features, contains a summary of the state of the issue and consists of 4 main points and conclusions.

Technological aspects of food production on the selected topic. It is necessary to reveal more deeply the problematic issues that have already been raised in the introduction ("Justification of the relevance of the chosen scientific problem") in a logical sequence. First, it is necessary to study the current state of the industry, which includes a selected group of food for the selected topic of the master's thesis, then - the existing technological problems and suggest possible ways to solve these problems. The decisive moment of this point is the choice of the way (direction) of the decision of problematic technological questions and the scientific substantiation of this way.

Characteristics of prescription components that are part of food products on the selected topic. For a more complete analysis of the selected food technology, diagnostics of the technological process should provide a description of the main and auxiliary raw materials of food (text or in the form of tables, figures, etc.).

Analysis of existing food technologies on the selected topic. Description of traditional directions of realization of technological process of the chosen food production.

Substantiation of the innovative solution of the technological problem of food products on the chosen topic. A number of innovative measures can be implemented. For example, by changing the chemical composition of food products and obtaining ready-made innovative food products with high content of

protein, dietary fiber, vitamins, macro-and micronutrients, etc. As an innovative solution, we can offer an extension of the shelf life of scientific development due to the introduction of various components and so on. It is possible, for example, to improve the textural characteristics of a new product (relative to the analogue product), introducing various structurants, etc. A promising innovative solution is the development of resource-saving food technologies, which is achieved by a number of opportunities: replacement of more expensive raw materials with cheaper ones; reduction of the technological process of production, etc

It should be taken into account that the proposed innovative food products should be compared with their products-analogues in chemical composition, organoleptic, physicochemical, rheological, microbiological properties.

Conclusions. It is worth summarizing the purpose and objectives of the study

4.2. Organization, object, subjects and methods of research (SECTION 2)

The organization of research includes the development of a general plan of theoretical and experimental research, which is presented in the form of a flowchart of research. The block diagram of researches contains the list of consecutive actions on formulation of tasks of the master's work, a choice of a number of laboratory researches (drawing, the table, the text) and implementation of results in practice. An example of a block diagram of research is given in Annex E.

The development of the plan-program of the experiment includes the name of the research topic, working hypothesis, experimental methodology, plan for creating an experimental situation, a list of necessary materials, devices, installations. In some cases, the plan-program includes work on the design and manufacture of devices, apparatus, devices, their methodological examination, as well as programs of research work at enterprises.

Object and subjects of research.

The object of study is developed or improved product technology.

Subjects of research- raw materials, semi-finished products used in the technology of preparation of products that are analyzed and developed. All products must meet the requirements of applicable regulations. This is confirmed by table 4.1

Table 4.1 - Characteristics of the products used in the work (example)

Product	Regulatory document, the requirements of which must meet the quality of the product
Drinking water	DSTU7525: 2014
etc.	

Research methods. When performing a master's thesis, modern research methods are used - standard and special organoleptic, physicochemical, rheological, microbiological methods for determining the quality and safety of raw materials, semi-finished products and finished products; mathematical methods of experiment planning and processing of experimental data using computer technology. It is necessary to provide their short description (it is desirable to allocate to 10 lines of the printed text for each technique). The standard method can only be referenced.

If the study uses standard methods for determining individual indicators, it is not necessary to describe these methods, it is enough to refer to the relevant standard.

The use of modern information technology to improve the efficiency of development is with combining information, its processing, visualization of scientific research, maintaining the protocol of the experiment, preparing a presentation and report, using various modeling methods. Using modern information technology, the master acquires skills to work with the main components of modern personal computer software and hardware, gets acquainted with the basics of computer-aided technology, from their formulation and construction of appropriate information models and ending with the interpretation of results, obtained by computer.

4.3. The results of experimental research, substantiation of product composition, technology, optimization of technological solutions for food production (SECTION 3)

Taking into account various technological factors, it is necessary to propose a draft recipe for new food products in order to be able to further study food products in the laboratory and possible adjustments based on the results of these studies.

At the first stage it is necessary to be guided by organoleptic indicators. Then you need to confirm the improvement by calculating the nutritional and energy value in the form of a table (Appendix D).

Characteristics of the raw materials used

The unit characterizes the organoleptic, physicochemical, technological properties of the additive used, changes in the analogue dish that will occur after its use.

Determining the amount of additive

At the first stage, the amount of additive is determined on the basis of

organoleptic evaluation, which is made in the form of table 4.2.

Table 4.2 - Comparative characteristics of organoleptic characteristics of the studied samples of cutlets (example)

Product name	The share of walnuts, % of meat	Product evaluation on a five-point scale					Overall score
		Appearance	Color	Smell, aroma	Consistence	Taste	
Cutlets cut from poultry № 732	-	5	5	5	5	5	25
Sample №1	10	5	5	5	4	5	24
Sample №2	15	5	5	5	5	5	25
Sample №3	20	5	5	5	4	4	23

The table shows that the optimal proportion of additives is 15% by weight of meat.

Substantiation of the composition and technology of food products

Analysis of the prescription composition of a new product

Analysis of the prescription composition of the new product in addition to the text description, it is proposed to provide in the form of a table of the following form: (table 4.3.).

Table 4.3 - Analysis of the prescription composition of the new product

Product name	Quantity of raw materials on _kg (pieces) of production, kg		Content,%	Role in the technological process
	B	N		

Determination of nutritional and energy value of analogue food and new products

The nutritional and energy value of dishes is calculated using the table, the form of which is given in Annex D. In the form of text provide an analysis of the results. The calculation is performed on the basis of data on the content of basic nutrients in raw materials and products that are part of the developed dish (product). To make a calculation, use the reference tables "Chemical composition of food products". [23]

Determining the shelf life of food products

All food products consist of certain raw materials, which in the process of storage is subject to decomposition and spoilage. Deterioration of quality and spoilage of food can not be prevented, but you can slow down the process of

deterioration by adding to the food formulation of substances with preservative properties, selection of processing methods, use of packaging, compliance with the necessary modes of storage and transportation of food.

In the process of improving or developing a new food production technology by making certain food additives, establishing the appropriate ratio of raw materials in the food recipe or changing production parameters, it is necessary to anticipate and determine the impact of innovation on food shelf life and safety.

Individual characteristics of food safety and quality depend on the specific food product and technology of its production, and can be studied through the use of physico-chemical and microbiological studies.

Testing the technology of a new dish

When developing technologies it is necessary to note:

- the name of the raw materials (products) used in the technological sequence, starting with the main ones;
- norms of bookmark of raw materials (products) by gross and net weight, when using semi-finished products - only by net weight;
- the mass of semi-finished products (if necessary), which is obtained in the process of cooking (product);
- yield of semi-finished and finished dishes (products).

In this section it is necessary to provide the table with a compounding of new food or culinary production with use in its structure of the offered innovative development. It is also necessary to provide a technological scheme of development.

It is worth remembering that the technological scheme is a scheme, each operation of which is characterized by all possible technological modes and parameters.

Improvement / development of equipment-technological scheme of food production

Improving or developing the technology of food production is completed by developing a hardware-technological scheme of its production, taking into account the implemented innovations.

In this section it is necessary to justify the choice of the proposed hardwaretechnological scheme of product production with indication of its advantages.

During the description hardwaretechnological scheme should pay attention to the following stages:

- supply and storage of raw materials and semi-finished products;
- preparation and supply of raw materials for production;
- receiving finished products;
- packing and packaging of products (if necessary);
- warehousing and shipment of products (if necessary).

Description hardware technological scheme should include all operations to the stage of packaging and shipment of finished products for consumption or storage and indicating the parameters of production, storage conditions of finished products in accordance with regulations or research. When describing the technological schemes in the text, the brands of equipment are given and the positions according to the hardware-technological scheme are indicated.

Optimization of technological solutions for food production

The section is made out on sheets of A4 paper. Records and drawings are placed on one side of the sheet. The printed results of the programs for an individual task are bound to the appendices to the diploma.

Contents of the section:

- 1) the purpose of optimization of a specific technological process according to the topic of research work;
- 2) initial data, according to the individual task;
- 3) a figure explaining the original data (if necessary);
- 4) theoretical formulas and calculations based on initial data;
- 5) summary table of initial data and results or results of calculations (depending on the specific technology);
- 6) a schedule based on the results of the calculation (if required);
- 7) conclusions on the results of calculations and in general on the work.

Objects of modeling and the generalized algorithm of development of mathematical models of technological processes

Food production, as a rule, is a sequence of three main operations: preparation of raw materials, direct transformation and production of target products. This sequence of operations is embodied in a single complex food processing system (HTS). Modern food enterprise, as a large-scale system, consists of a large number of interconnected subsystems, between them there are relationships of subordination, having a hierarchical structure with three main stages.

Under the food technological system is understood a set of physico-chemical production processes and means for their implementation. Thus, the food technological system contains: prescription composition, the actual process, the parameters of technological processes and equipment through which various operations are performed, means for control and management of processes and communication between them.

The system interacts with the external environment and can be quantified by a set of input parameters X and output parameters Y (Fig. 4.1).

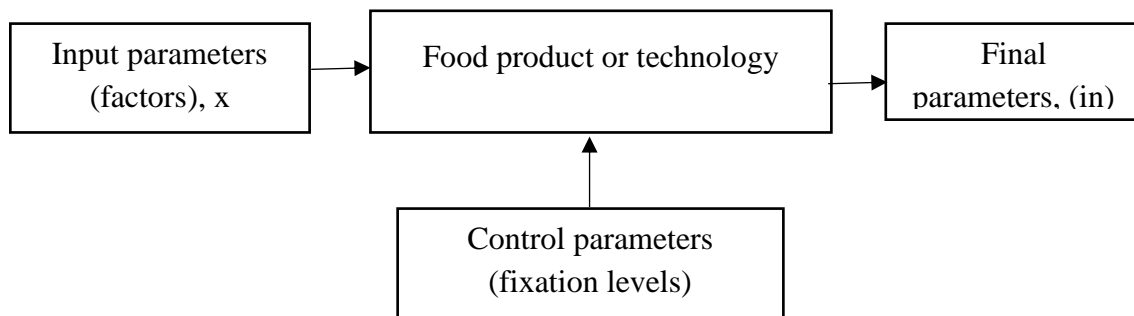


Figure 4.1 - The simplest structure of the system

As input parameters, you can take the amount of processed raw materials, its composition, temperature, etc .; initial parameters can be: the amount of finished product, concentration, rheological parameters, shelf life, temperature and other properties. To match the output parameters to the set values, they are influenced by control variables.

Thus, HTS is a rather complex object that can be divided (decomposed) into constituent subsystems, or elements. These subsystems are informationally connected with each other and, possibly, with the environment of the object.

The sequence of solving problems by methods of experimental and statistical modeling

Traditional technologies of restaurant products use mainly empirical approach to the selection of ingredients and parameters of technological operations, sometimes unjustified in terms of physicochemical processes, their optimality, economic feasibility, without taking into account the broad capabilities of technological systems, which reduces the competitiveness of food.

A scientifically sound approach to the design of technological systems of food production requires the active use of mathematical apparatus for modeling the technological process, finding the optimal solution to streamline the technological cycle of food production.

Problems of experimental and statistical modeling, as well as any scientific and technological problems, are solved by a certain sequence of actions which allow to pass a way from statement of these problems to reception of results. These steps will be present in solving any practical problem based on these methods.

Stage 1 - the formation of goals and objectives of the study. At this stage, the goals and objectives are to be directly formulated, which should be solved based on the results of the study. This can be, for example, the task of optimizing the object under study. Here the volumes and sources of financing of researches, means for their carrying out, etc. are defined.

Stage 2 - selection of response functions. At this stage, the analysis of all the resulting variables of the object and select those that will be used in the study as response functions. Response functions can select one or more result variables. It is clear that these variables must first meet the purpose and objectives of research, and secondly meet the criteria established for the response functions. In addition, at this stage, select, or if necessary set the scale of numerical estimates of the response functions, choose the method and determine the error of measuring the desired resultant values and recording the results of these measurements.

Stage 3 - selection of factors. Factors that will vary in the study are selected so that they significantly affect all or most of the response functions. In addition, obviously, the factors must meet the requirements for them. If necessary, the results of previous studies can be analyzed or some, usually insignificant, number of experiments can be performed to test the significance of the influence of certain factors. The choice of the number of factors must be treated extremely responsibly. The introduction of unnecessary factors in the study can lead to a significant increase in the volume of experiments. At the same time, the non-inclusion of significant factors in the study will lead to incomplete and erroneous results, which will call into question the study as a whole. At the same stage, establish areas for determining the factors

Stage 4 - choosing the type of experimental-statistical model and experimental plan. At this stage, in accordance with the task and according to preliminary data on the type of response functions, the order of the future experimental-statistical model (method of nonlinear programming, multifactor experiment) is chosen. Given the number of factors selected for the study, get a general view of the model. Based on the selected type of model, the experiment plan is chosen, and based on the selected plan, the number of individual experiments and the conditions for their conduct are set. In addition, immediately set the number of experiments that must be conducted at the same levels of factors - the so-called parallel experiments.

Stage 5 - implementation of the experimental plan. At this stage, there is a direct conduct of experimental research. It is clear that the research is conducted in the conditions provided by the plan. From a statistical point of view, the principle of randomization must be followed when conducting experiments. This principle assumes that individual experiments should be performed not sequentially as indicated in the plan, but in a random order. This is especially true of parallel experiments.

Stage 6 - regression analysis. This stage is also sometimes called mathematical processing of experimental results. Regression analysis involves solving the following tasks: assessment of reproducibility of experiments and detection of gross errors in their conduct, calculation of numerical estimates of the coefficients of experimental-statistical model, assessment of the significance

of individual components of the model - regressors, and assessment of the adequacy of the model.

Stage 7 - direct implementation of the purpose of the study, solving the problems set at the first stage on the basis of developed experimental and statistical models.

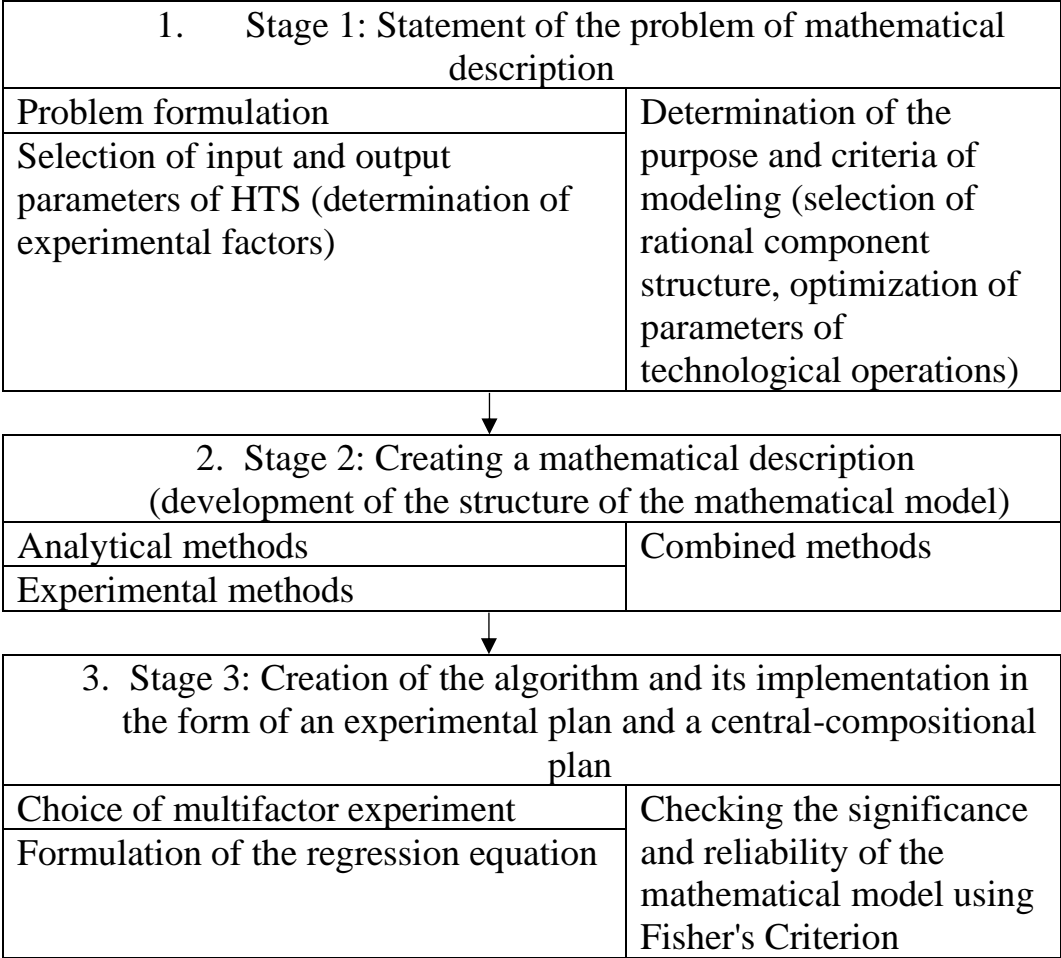


Figure 4.2 - Generalized algorithm for developing mathematical models

An example of optimizing the nutritional value of a food product is presented in Annex J.

4.4. Analysis of technology and identification of hazardous factors of food production (SECTION 4)

The production of safe products is the main goal of every food industry enterprise.

To ensure consistently high quality and safety of finished products, the State Standard and the laws of Ukraine provide for the mandatory implementation of the international food safety system of the HACCP in food industry enterprises.

HACCP system (**H**azard**A**nalysisand**C**ritical**C**ontrol**P**oint) is a warning system for food safety. It is based on the judicious application of technical and scientific principles to the entire food production chain: from the field (field) to the table.

The purpose of HACCP is to identify consumer hazards that may occur throughout the production chain and to establish controls to ensure the safety of the product for the consumer.

The modern HACCP system is based on seven principles:

Principle 1. Carrying out the analysis of dangerous factors.

Principle 2. Identification of critical control points.

Principle 3. Setting limit values.

Principle 4. Introduction of CCT control system.

Principle 5. Establish corrective actions to be taken when observations indicate that a particular CCP is spiraling out of control.

Principle 6. Establish a verification procedure to confirm that the HACCP system is working effectively.

Principle 7. Develop methods for documenting all procedures and keeping records related to the application of these principles.

This section of the qualification master's thesis is performed during the professional practice at the enterprises of the industry by developing a HACCP plan for the production of products on the subject of the qualification work. To write this section, you need to use guidelines for professional practice in food industry for masters [31].

4.5. Calculation of the expected economic effect from the introduction of a new product (SECTION 5)

The calculation of the economic part of the qualifying master's thesis should be performed based on the received tasks for the qualifying work. It is proposed to consider 2 options for calculations.

"Production in a separate unit"

The practical part of the calculation of economic efficiency from the introduction of an innovative product should begin with the development of a production program. The peculiarity of the formation of the production program in market conditions is taking into account the role of marketing in the formation of the plan of production and sales of the enterprise.

Production program - it is a system of address tasks on production and delivery of production to consumers in the expanded nomenclature, assortment, corresponding quality and in the established terms according to supply contracts.

- *Nomenclature* Is a list of names of separate types of production

- *Assortment* - is a variety of products within this range.

Indicators of the production program	Natural - characterize the production specialization of the enterprise and its frequency in the commodity market
	Cost - give a generalized assessment of the enterprise, expressed in monetary terms

The volume of production can be calculated through the amount of resources:

$$VP (TP) = H * P,$$

where H - the number of employees, people ..

P - labor productivity, which can be expressed as output, UAH / person.

or

$$VP = P * K_v,$$

where P is the design production capacity of the enterprise, UAH

K_v - coefficient of utilization of design production capacity

The results of the calculation of the production program are recorded in table

4.4.

Table 4.4 - Volume of production in value terms

Type of product	Annual production, t	Wholesale and selling price, UAH	Cost of sold products, thousand UAH
Total:			

Calculation of capital investments (if available)

To determine the capital investment for the purchase, delivery and installation of equipment make an estimate and financial calculation according to the form shown in table 4.5.

Table 4.5 - Estimate of costs for the purchase, delivery and installation of equipment

Name	Number of units	Price per unit, UAH	The cost is UAH thousand.

All equipment			
Transport costs (5% of the cost of equipment)			
Installation costs (20% of the cost of equipment)			
Together			

Calculation of working capital ratio

To ensure the smooth and efficient operation of the enterprise, it is advisable to calculate the ratio of working capital.

The ratio of working capital advanced to raw materials, basic materials and purchased semi-finished products is determined by the formula:

$$H = P * D$$

where N - working capital ratio in stocks of raw materials, basic materials and purchased semi-finished products;

P - average daily consumption of raw materials and purchased semi-finished products (based on technological calculations)

D - stock rate in days.

The average daily consumption according to the nomenclature of consumed raw materials, basic materials and purchased semi-finished products is calculated by dividing the sum of their costs for the corresponding quarter by the number of days in the quarter.

Determining the stock rate is the most time-consuming and important part of rationing. The stock rate is set for each type or group of materials. If many types of raw materials are used, the rate is set for the main types, which occupies at least 70-80% of the total cost.

Calculation of production costs

The calculation of the cost of production and sales consists of the calculation of the following main items:

The article "Raw materials and basic materials" provides for the calculation of the cost of raw materials and basic materials (excluding VAT) and the cost of transportation.

Table 4.6 - Costs of raw materials and basic materials

Raw	Norm of kg / 1000kg	Price, UAH / t (m3)	Cost, UAH
Together			

The article "Auxiliary materials" includes the cost of purchasing packaging materials and containers.

Recent marketing research shows that 85% of consumers pay attention to food packaging first. Therefore, the effectiveness of sales of goods may depend on the packaging.

Table 4.7 - Costs of auxiliary and packaging materials

Raw	Norm of kg / 1000kg	Price, UAH / t (m3)	Cost, UAH
Together			

To calculate the item "Energy consumption" use the norms of consumption of electrical and energy resources per unit of output (steam, electricity, water, cold). The norms of costs and the actual amount of consumed energy resources the student receives in the process of observation during the internship at the enterprise.

Table 4.8 - Energy consumption for technological purposes

Raw	Norm of kg / 1000kg	Price, UAH / t (m3)	Cost, UAH
Water, m3		13.0	
Electricity, kW / h		1.93	
...		...	
Together			

Expenses on the article "Basic salary"

Remuneration Fund - the total amount of all costs for the payment of employees of the enterprise and social benefits. It consists of: the tariff salary fund of watchmakers and businessmen, surcharges on bonus systems.

In the calculation we will accept:

Annual effective working time fund per 1 worker.

Calendar fund 365 days.

Holidays 10 days.

Weekends 104 days.

Nominal working time fund 251 days.

The duration of the shift is 8 hours.

Annual effective working time fund per 1 employee: 1770.4 hours.

Minimum salary: from December 1, 2016 - UAH 1,600. (hourly UAH 9.59);

from January 1, 2017 - UAH 3,200. (hourly UAH 20.18).

The rate of production is determined by dividing the annual volume of production by the amount of time worked.

Determine how many hryvnias of basic salary per 1 ton of product:

Basic salary / Annual production

Table 4.9 - Basic salary

Employee	Hourly tariff rate, UAH/hour.	Basic salary, UAH	Additional salary, UAH	Deductions for social events, UAH	General salary fund, UAH
Technologist	26.15				
Stacker-packer	20.18				
...					
Together					

Expenses under the item "Additional salary" are accepted in the amount of 10% of the basic salary.

Expenses under the item "Social security contributions" are accepted in the amount of 37.5% of the total salary fund (basic and additional salaries in the amount).

Costs associated with the preparation and development of production are accepted in the amount of 2% of the basic salary.

Costs for maintenance and operation of machinery and equipment are determined depending on the complexity of the innovative solution:

- we accept in the amount of 20% of the basic salary in the absence of capital investments;

- is calculated for groups of fixed assets as a percentage of initial cost using the initial data given in table 4.10 (if capital investments are available).

Table 4.10 - Calculation of depreciation and repair costs

Fixed assets	Amortization		Expenses for capital and current repairs		Costs together thousand UAH
	%	thousand UAH	%	thousand UAH	
Buildings and structures	4.5		5		
Machinery and equipment	12		5		
Others	6		5		
Together					

We accept overhead costs in the amount of 50% of the basic salary.

Production cost is the sum of the above cost items.

Administrative costs are 1.5% of the production cost of production.

Sales costs are 10% of the production cost of production.

Other operating expenses are 5% of the production cost of production.

The total cost is the sum of production costs, marketing costs, administrative and other costs.

Table 4.11 - Costs of production and sales

cost item	The amount of costs, UAH
Raw materials, UAH	
Auxiliary materials, UAH	
Energy consumption, UAH	
Salary fund, UAH	
Deductions for social events, UAH	
Development costs, UAH	
Costs for repair and maintenance of equipment, UAH	
Production cost, UAH	
Administrative expenses, UAH	
Other expenses, UAH	
Implementation costs, UAH	
Total cost, UAH	

In market conditions, the approach to pricing taking into account the main technological indicators is important for improving the quality of products of processing enterprises, which leads to increased yield and improved quality of finished products.

Pricing - the process of substantiation, approval and revision of prices for new and existing goods and services.

Table 4.12 - Pricing methods

Pricing methods	
1. The method of "costs + profit" $C = CB + P$, where C - the price of the product, JI - unit cost of production, P - expected profit per unit of output	2. Obtaining the target rate of return $C = V_{zm} + (V_{post} + P_{zag}) / H$, where C - the price of the product, V_{zm} - variable costs per unit of output, Post - fixed costs, P_{zag} - expected profit, H - rate of return
3. Estimation of consumer value	4. Proportional pricing
5. The method of "expected profit"	6. The method of rapid cost recovery

1. Gross profit, thousand UAH:

$$P = B - C,,$$

where, P - profit, thousand UAH;

B - cost of sold products, thousand UAH;

C - cost of production, thousand UAH;

2. Profitability of production,%;

$$P = \frac{\Pi}{C} * 100$$

3. Costs per 1 UAH. cost of manufactured products, UAH;

$$B_T = \frac{C}{B}$$

4. Production per employee, thousand UAH;

$$B_{\Pi} = \frac{B}{\Pi} ,,$$

where H - number of employees, people;

5. Return on assets (subject to the calculation of capital investments), UAH;

$$\Phi_B = \frac{B}{K_{\text{овф}}} ,,$$

where Kovf - the cost of fixed assets, thousand UAH

6. Payback period of investments (subject to the calculation of capital investments), year.

$$T_O = \frac{K_B}{\Pi} ,,$$

where KV - capital investment, thousand UAH

Investments should be understood as additional investments for the introduction of new product production (purchase of new equipment, construction of technological premises, etc.).

The main technical and economic indicators of the project are presented in the form of table 4.13.

Table 4.13 - The main technical and economic indicators of the project

Indexes	Units of measurement	Indicator
Production capacity of the enterprise by main types of products	t / year	
Annual volume of raw material purchase	t	
Sales revenue	thousand UAH	
Number of industrial production staff	People.	
Production per employee	thousand UAH	
The total cost of production	thousand	

	UAH	
Costs per 1 UAH. manufactured products	UAH	
Gross profit	thousand UAH	
Net profit	thousand UAH	
Profitability of production	%	
The cost of capital investment	thousand UAH	
Payback period	years	
Return on assets		

Draw conclusions about the feasibility of introducing a new product.

When drawing conclusions, it is necessary to remember not only about economic, but also about social significance of the received dishes.

The social efficiency of the food industry is manifested in the improvement of health, increase of working capacity and life expectancy of the population, as well as in the level of general professional development of workers, better content of work, etc. From the point of view of public interests, this is a comparison of the actual level of food consumption with a scientifically sound norm and the total consumption in kilocalories and in terms of basic food products.

It is expedient to carry out the analysis of social efficiency of the specified project on the following indicators.

- Consumption of basic food products per capita.
- The level of satisfaction of the needs of the population in basic foodstuffs is calculated as the ratio of the average per capita consumption of basic foodstuffs to the scientifically substantiated physiological norms of their consumption.
- Caloric content of per capita food consumption per capita.
- The level of satisfaction of needs in the total amount of food (calculated as the ratio of the actual caloric content of average daily consumption per capita to scientifically sound physiological norms).
- Average daily consumption of micro- and macroelements by the population.
- Volumes of production of dietary food products, baby food products, products with medicinal properties, etc. and the level of satisfaction of their needs.
- The share of costs.

REFERENCES

The main literary sources

1. Law of Ukraine "On Entrepreneurship". Information of the Verkhovna Rada of Ukraine as amended by the Laws of Ukraine of December 21, 1999 №1328 – XIV.
2. Law of Ukraine "On Enterprises in Ukraine". Information of the Verkhovna Rada of Ukraine of March 27, 1991, № 24.
3. Law of Ukraine "On Consumer Protection". Resolution of the Verkhovna Rada of Ukraine of December 15, 1993
4. DSTU ISO 9000-2001 "Quality management systems. Basic provisions and vocabulary".
5. DSTU ISO 9001-2001 "Quality management systems. Requirements".
6. DSTU ISO 9004-2001 "Quality management systems. Guidelines for improving performance.
7. DSTU 3410-96 UkrSEPRO certification system. Substantive provisions.
8. DSTU 3413-96 UkrSEPRO certification system. Procedure for product certification.

9. DSTU 3414-96 UkrSEPRO certification system. Certification of production. The order of implementation.
10. DSTU 3415-96 UkrSEPRO certification system. System registry.
11. DSTU 3416-96 UkrSEPRO certification system. Procedure for registration of voluntary certification objects.
12. DSTU 3279-95 "Standardization of services. Substantive provisions".
13. DSTU 3008-95 "Documentation. reports in the field of science and technology. Structure and design rules »
14. DSTU 4161-2003. DSTU 4161-2003. Food safety management systems. Requirements.
15. Decree of the Cabinet of Ministers of Ukraine "On standardization and certification".
16. Law of Ukraine "On labor protection". Resolution of the Verkhovna Rada of Ukraine of January 1, 2004
17. Law of Ukraine "On the quality and safety of food and food raw materials."
18. Law of Ukraine "On Environmental Protection".
19. Decree of the Cabinet of Ministers of Ukraine "On standardization and certification".
20. Code of Ukraine "On Administrative Violations".
21. Resolution of the Cabinet of Ministers of Ukraine dated 09.11.96 №1371 "On improving quality control and food safety".
22. Rules of operation of catering establishments (enterprises) (Order № 219 of July 24, 2002 of the Ministry of Economy and European Integration of Ukraine).
23. Cherevko OI, Malyuk LP, Deinichenko GV Collection of normative documents of state regulation in the field of restaurant business. - Kharkiv: PKF "Favor LTD", 2003. - 440 p.
24. Collection of recipes for dishes and culinary products: For catering companies / ed. А.И.Здобнов, В.А. Цыганенко. К. : ООО "Izdatelstvo Ariy", М. : IK TC "Lada", 2010. - 680 p.
25. Technology of food products of functional purpose: monograph / M.I. Ordinary, MF Kravchenko and others. ; for order. E. Peresichnoho - Kyiv: Kyiv. nat. auction -econ. University, 2008. - 718 p.
26. Collection of recipes of dishes and culinary products (technological maps) with the use of biologically active additives / [Peresichny MI, Kravchenko MF, Korzun VN etc.] ; under the direction of E. Average. - К.: Книга, 2004. - 428 с.
27. Human nutrition and the modern environment: theory and practice / Peresichny MI, Kravchenko MF, Korzun VN, Grigorenko OM - К.: КНТЕУ. 2002. - 526 p.

28. Food and nutritional supplements. The role of dietary supplements in disease prevention / trans. with English under ed. J. Ransley, J. Donelli, N. Reed. - М.: Мир, 2004. - 312 с.

29. Organization of service in the restaurant industry: a textbook, ed. BUT. Friday. - К.: КНТЕУ, 2005. - 632 с.

30. Restaurant service. Fundamentals of international service practice for professionals and beginners / S. and L. Siegel, X. and R. Lenger, G. Stickler, W. Gutmeier. - М.: Центрополиграф, 2007. - 287 с.

31. Methodical instructions for professional practice at food enterprises of the industry for students 1 course OS "Master" specialty 181 "Food Technology" / way. F.V. Перцевой, О.Ю. Мельник, С.М. Sabadash, N.V. Болгова, О.Г. Wednesday. - Sumy, 2021. - 32 p.

Additionally

32. Bulgakova AS Nutritional supplements: a guide / A.S. Bulgakov. 2nd ed. reworked. and ext. - М.: ДеЛи принт, 2001. - 436 с.

33. Vanhanen VV The doctrine of nutrition / VV Vanhanen, W.D. Vanhanen. - Donetsk Donetsk region. 2000. - 352 p.

34. Efimova Yu.A. Zffektivnoe menu: concept and design / Yu.A. Ефимова. - М. Restaurant, department., 2006. - 176 p.

35. Ivannikova E. Bar business / E. Ivannikova: textbook. - Rostov n / D: Phoenix, 2002.

36. Kaprelyants LV Functional food products / L.V. Kaprelyants, KG Iorgacheva. - Odessa: Druk, 2003. -312p.

37. Karpenko PA Biologically active additives and bioproducts / P.A. Karpenko. - К.: Нора-принт, 2000. - 168 с.

38. Kasyanov GI Technology of children's issues / GI Kasyanov. - М.: Академия, 2003.

39. Mazaraki AA Design of restaurants: textbook. way. for higher education. lock / Mazaraki AA, Peresichny MI, Shapoval SL ; for order. A.A. Mazaraki. - К.: КНТЕУ, 2008. - 307 с.

40. Nechaev AP Nutritional supplements / A.GI Nechaev, AA Кочеткова, А.Н. Zaitsev. - М.: Колос, 2001. - 256 с.

41. Radchuk OV Methodical instructions on the design of course and qualification works by full-time and part-time students for all areas and specialties of the Faculty of Food Technology / O.V. Radchuk, Yu.V. Nazarenko, NK Tower. - Sumy: SNAU, 2014. - 61 p.

42. Domaretsky VA, Ostapchuk MV, Ukrainets AI Food Technology: Textbook / Edited by Dr., Prof. AI Ukrainian. - К.: НУХТ, 2003. - 572 с.

43. Collection of recipes for flour confectionery and bakery products for catering establishments. - М.: Экономика, 1985. - 295 с.

44. Technology of products from hydrobionts / С.А. Артюхова, В.Д. Богданов, VM Datsun et al. - М.: Kolos, 2001. - 476 p.
45. Collection of recipes for meat products and sausages. СПб.: Professional Publishing House, 2001. - 322 p.
46. National standardization. Main provisions: DSTU 1.0: 2003. - [Effective from 2003-07-01]. - К.: Держспоживстандарт України, 2003. - 10 с. - (National standard of Ukraine).
47. National standardization. Rules of construction, teaching, design, approval, acceptance and designation of technical conditions: DSTU 1.3: 2004. - [Effective from 2005-01-01]. - К.: Держспоживстандарт України, 2004. - 16 с. - (National standard of Ukraine).
48. National standardization. Rules of registration of normative documents: DSTU 1.6: 2004. - [Effective from 2004-10-01]. - К.: Держспоживстандарт України, 2004. - 22 с. - (National standard of Ukraine).
49. National standardization. Standardization and related activities. Terms and definitions of basic concepts: DSTU 1.1: 2001. - [Effective from 2001-07-01]. - К.: Держспоживстандарт України, 2001. - 38 с. - (National standard of Ukraine).
50. On standardization: Law of the Russian Federation, June 10, 1993 [Electronic resource]. - Access mode: http://www.fstec.ru/_docs/doc_1_2_007.htm (access date: 1.11.2011). - Title from the screen.
51. About standardization: the project of the Federal law, 19.03.2009 [Electronic resource]. - Access mode: <http://www.ugfm.ru/Page257.html> (access date: 1.11.2011). - Title from the screen.
52. About technical regulation: the Federal law, 27.12.2002 [Electronic resource]. - Access mode: <http://www.consultant.ru/popular/techreg/> (access date: 1.11.2011). - Title from the screen.
53. About safety and quality of food products: Law of Ukraine, 23.12.1997 [Electronic resource]. - Access mode: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?page=1&nreg=771%2F97-%E2%F0> (access date: 1.11.2011). - Name from the screen.
54. Products produced under the technical conditions of Ukraine (as of 01.01.2009): reference book: at 2 p.m. / [answer. for the publication of TI Lyubomirov]. - К.: ДП «Укрметртестстандарт», 2009.
55. On protection of consumer rights: Law of Ukraine, 12.05.1991 [Electronic resource]. - Access mode: <http://zakon2.rada.gov.ua/laws/show/1023-12> (access date: 1.11.2011). - Name from the screen.
56. On the basic principles of state supervision (control) in the sphere of economic activity: Law of Ukraine, April 5, 2007 [Electronic resource]. - Access mode: <http://zakon2.rada.gov.ua/laws/show/877-16> (access date: 1.11.2011). -

Name from the screen.

57. On standardization: Law of Ukraine, May 17, 2001 [Electronic resource]. - Access mode: <http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=2408-14> (access date: 1.11.2011). - Name from the screen.

58. On standardization and certification: Decree of the Cabinet of Ministers of Ukraine, 10.05.1993 [Electronic resource]. - Access mode: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=46-93> (access date: 1.11.2011). - Name from the screen.

59. On standards, technical regulations and conformity assessment procedures: Law of Ukraine, December 1, 2005 [Electronic resource]. - Access mode: <http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=3164-15> (access date: 1.11.2011). - Name from the screen.

60. Law of Ukraine "On Higher Education" of 01.07.2014 № 1556-VII,

61. The procedure for awarding scientific degrees, approved by the Resolution of the Cabinet of Ministers of Ukraine of July 24, 2013 № 567,

62. Regulations on the Specialized Academic Council, approved by the Order of the Ministry of Education and Science, Youth and Sports of Ukraine dated 14.09.2011 № 1059,

63. Regulations on the attestation board of the Ministry of Education and Science, Youth and Sports of Ukraine, approved by the Order of the Ministry of Education and Science, Youth and Sports of Ukraine dated 14.09.2011 № 1059,

64. DSTU 8302: 2015 "Information and documentation. Bibliographic link. General provisions and rules of compilation ",

65. Requirements for dissertations and dissertation abstracts, published in the Bulletin of the Higher Attestation Commission of Ukraine № 9–10, 2011

66. Regulations on the final qualification project (work). - KNTEU, 2015. - 17 p.

67. Regulations on master's qualification work. Vinnytsia VNTU, 2010. - 10 p.

68. Methodical instructions for the design of course and qualification works / OV Radchuk, Yu.V. Nazarenko, NK Bashtova. - Sumy, SNAU, 2014.

69. National standard of Ukraine. Information and documentation. Bibliographic link. General provisions and rules of compilation. DSTU 8302: 2015. Kyiv SE "UkrNDNC" 2016

ACCESSORIES

Addition A

**Statement addressed to the head of the graduating department
regarding the approval of the topic of the master's thesis**

To the Head of the Department

Name of the head departments

Name of the student

gr .____, _____ course,

specialty, specialization, faculty

Statement

Please approve the topic of the final qualifying work:

according to the materials

full legal name of the enterprise / organization / institution

date student's signature

Addition B

Blank-task of master's work

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRICULTURAL UNIVERSITY**

Faculty Food technology

Chair Food technology

Educational degree Master

Specialty: 181 "Food Technology"

I APPROVE
Head of Department
food technology
Pertsevoi F.V

_____ 20__ p.

TASK

FOR THE STUDENT'S MASTER'S THESIS

Ivanov Ivan Ivanovich

(Full Name)

1. Theme of master's work Improving the technology of dessert paste using walnut

kernel concentrate

supervisor of the master's thesis _____
(scientific degree, academic title, surname, name, patronymic)

approved by the order of the higher educational institution from “ ___ ” ___ 20__
№ ___

2. Deadline for student submission of work

3. Initial data to work _____

4. Contents of the settlement and explanatory note (list of issues to be developed): Introduction; Section 1. Analytical review of the literature; Section 2. Organization, object, subjects and methods of research; Section 3. Substantiation of the content of the investigated additive / formulation of a new product / parameters of the technological process of food production; Section 4. Improvement / development of food technology / study of quality indicators of new food products; Section 5. Analysis of hazardous factors of food production (HACCP); Section 6. Analysis and generalization of results of economic researches of technology of the chosen product and ways of its application in industrial conditions; Conclusions; References; Additions.

5. List of graphic material (photos, drawings, diagrams, graphs, tables) Visual support of the master's thesis using Power Point

6. Consultants of work sections

Section	Surname, initials and position consultant	Signature, date	
		task issued	task accepted
Section 6			

7. Date of issuance of the task _____

CALENDAR PLAN

№ s / n	Name of stages of master's work	Term of performance of stages of master's work	Signature of the head
	Section 1 Analytical review of the literature (on the selected topic).		
	Section 2 Organization, object, subjects and methods of research.		
	Section 3 Substantiation of the content of the investigated additive / recipe of a new product / parameters of the technological		

	process of food production.		
	Section 4 Improvement / development of food technology / study of quality indicators of new food products.		
	Section 5 Food Hazard Analysis (HACCP)		
	Section 6 Analysis and generalization of results of economic researches of technology of the chosen product and ways of its application in industrial conditions.		
	Text of conclusions, proposals, formation of appendices		
	Submission of the electronic version of the work to the repository		

Student _____
 (signature) (surname and initials)

Supervisor _____
 (signature) (surname and initials)

Addition B
Title page of the work (example)

MINISTRY OF SCIENCE AND EDUCATION OF UKRAINE
SUMY NATIONAL AGRICULTURAL UNIVERSITY

Department of Food Technology

QUALIFICATION MASTER'S THESIS

on the topic: "Improvement of the technology of filling based on sour milk cheese for pancakes using sesame seed concentrate"

Completed: _____ course student,
group _____

specialty 181 "Food Technology"
Name and surname

(surname and initials)

Head _____

(academic degree, title, surname and initials)

Reviewer _____

(academic degree, title, surname and initials)

SUMY 202-

Addition D

Illustrative material (example)

Sumy National Agrarian University
Department of Food Technology

ILLUSTRATIVE MATERIAL TO THE REPORT ON DEFENSE GRADUATION OF QUALIFICATION WORK

on the topic:

topic name

Student ____ course, ____
group,
specialty (code, name)
specialization (name)

student's signature

Full Name

Supervisor
degree
academic status

signature of the head

Full Name

SUMY 20... ..

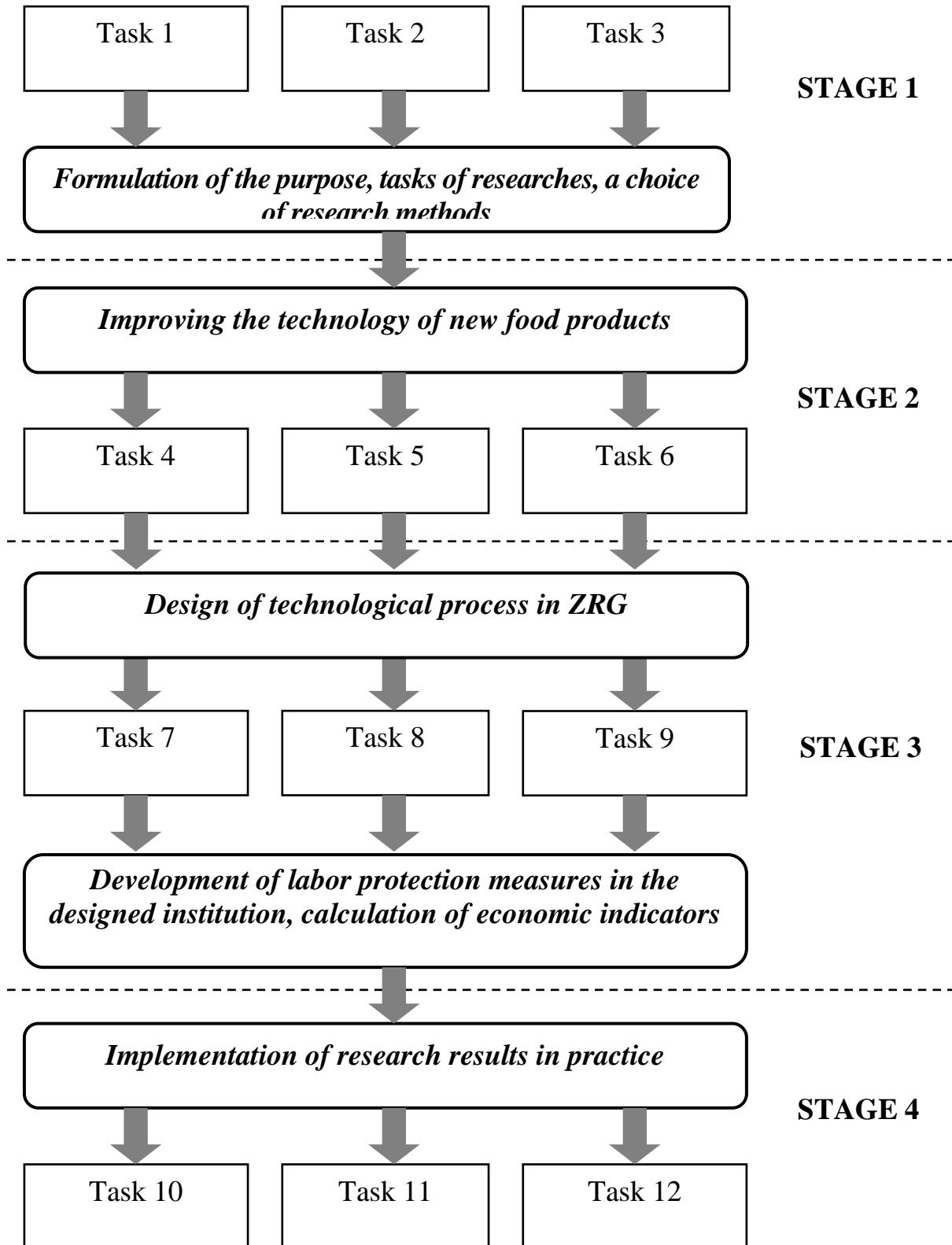
Addition D

Table D.1 - Characteristics of nutritional and energy value of dishes (example)

№ s / r	Dish and ingredients	Index of nutritional value tables	Net weight	Contents								Energy value of kcal	
				Proteins, g			Fats, g			Carbohydrates, g		IN 100 g	In the dish
				IN 100 g	In the dish	Includin g animal	IN 100 g	In the dish	Includin g vegetabl e	IN 100 g	In the dish		
2	3	4	5	6	7	8	9	10	11	12	thir teen	14	
	Semolina with apples	1,205 th most common											
	Semolina		19	10.3	1.9	-	1.0	0.19	0.19	67.7	12.8	238	45.22
	Milk	Pasteurize d, 3.5% fat	195	2.79	5.4	5.4	3.5	6.8	-	4.69	9.1	61	118.9
	Apples		35	0.4	0.14	-	0.4	0.14	0.14	9.0	3.15	45	15.75
	Butter	Unsalted	5	0.5	0.02	0.02	82. 5	4.1	-	0.8	0.04	748	37.4
	Sugar		10	-	-	-	-	-	-	99.98	9.9	387	38.7
	Total I		230		7.46	5.42		11.23	0.33		34.9		255.9
	Total II		100		3.24	2.35		4.83	0.13		15		110.1
	Total, taking into account losses		100		3.2	2.3		4.7	0.1		14.8		108.9

Addition G

BLOCK-SCHEME OF ANALYTICAL, EXPERIMENTAL RESEARCH AND CALCULATIONS



**METHODOLOGICAL INSTRUCTIONS FOR PERFORMANCE
OF QUALIFICATION MASTER'S THESIS**

Sumy, RVV, Sumy National Agrarian University, st. Gerasim Kondratiev,
160

Signed for printing: 2020 A5 format: Times New Roman typeface
Circulation: ___ copies Order _____ Um. printing. arch.
