

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

**Department of Animal Production and Processing Technology and
Cynology**

APPROVED

Head of the Department

[Signature] - 04 05, 2020
Pavlenko Yu.M.

SYLLABUS

Optimization of technologies in animal husbandry

Specialty: 204 – “Livestock production and processing technologies of animal products”


Educational program: 204 – “Livestock production and processing technologies of animal products”

Education degree: “Ph.D.”

Faculty: “Biology and Technology


2020-2021 academic year

Syllabus on discipline Optimization of technologies in animal husbandry for the applicants of the EL "Doctor of Philosophy", specialty 204
Technology of production and processing of livestock products.

Developed: Phd, Associate Professor  Pavlenko Yu.M.

This syllabus was approved at a meeting of the Department of Animal Production and Processing Technology and Cynology

Minutes of meeting of May 04, 2020, No. 9

Head of the Department of Animal Production and Processing Technology and Cynology  (Pavlenko Yu.M.)

Programme leader

 (L.M. Khmelnychi)

Head of postgraduate and doctoral studies



Description of the course

Indicators	Field of study, subject area, educational and qualification level	Characteristics of the discipline
		Full-time study
Amount of credits – 4.0	Field of study: 0901 Agriculture and forestry	Elective
Modules – 4	Subject area: 204 - Technology of production and processing of livestock products	Academic year 2020-2021
Content modules: 4		Year 2
		Semester 4
Total amount of hours – 120		Lectures 44 hours
Weekly hours for full-time study: classroom - 6 independent work of the postgraduate student - 1	Educational level: Doctor of Philosophy	Practical classes, seminars 44 hours
		Laboratory classes -
		Individual work 32 hours
		Individual tasks: -
		Type of assessment: credit

The ratio of the number of classroom hours to independent and individual work is (%):
for full-time study - 73/27

Description of the course

Indicators	Field of study, subject area, educational and qualification level	Characteristics of the discipline
		Full-time study
Amount of credits – 4.0	Field of study: <i>0901 Agriculture and forestry</i>	<i>Elective</i>
Modules – 4	Subject area: <i>204 - Technology of production and processing of livestock products</i>	Academic year
Content modules: 4		2020-2021
		Year
		2
		Semester
Total amount of hours – 120		4
Weekly hours for full-time study: classroom - 6 independent work of the postgraduate student - 1	Educational level: <i>Doctor of Philosophy</i>	Lectures
		44 hours
		Practical classes, seminars
		44 hours
		Laboratory classes
		-
		Individual work
		32 hours
Individual tasks:		
-		
		Type of assessment: <i>credit</i>

The ratio of the number of classroom hours to independent and individual work is (%):
for full-time study - 73/27

• **The purpose and objectives of the course**

Purpose: The purpose of the course is to acquire the knowledge of the optimization of technologies in the dairy and meat cattle breeding, pig breeding, poultry farming abroad and in Ukraine by the postgraduate students about.

Objective: To provide theoretical knowledge and to develop skills to optimize reproduction, feeding, keeping and rational use of cattle, pigs and poultry in order to maximize their genetic potential without disturbing the environment. To obtain also the ability to model technological processes of milk and beef production, pork and poultry production for specific farms of different ownership and specialization.

To know:

Ways to optimize technologies in the dairy and beef, pig, poultry in Ukrainian and foreign industries in order to maximize their genetic potential without disrupting the environment.

To be able to: develop knowledge of technology optimization in the fields of dairy and meat cattle breeding, pig breeding, poultry breeding abroad and in Ukraine by applying abstract thinking, analysis and synthesis of the obtained information. Use information and communication technology skills when seeking information. Implement the ability to generate new ideas. If necessary, work autonomously, evaluate and ensure the quality of work performed. Model technological processes of milk and beef production, pork and poultry production for specific farms of different ownership and specialization.

• **The educational discipline program**

Content module 1. Optimization of technological processes in dairy cattle

Topic 1. Modeling of technological processes in animal husbandry. Concepts about technology, technological and work processes, sketchy, working and operational modeling of processes in animal husbandry. Principles of modeling of technological processes. Technological scheme and organizational modes of the process. The rhythm and tact of the process, the volume of work, their importance in the organization of technological process. Principles, procedure for development and maintenance of technological documentation. Organization of technological process management.

Topic 2. Industrial technology of milk production in farms of different types. Conditions, that determine the efficiency of milk production on highly mechanized, conventional farms and agrarian enterprises. The essence of industrial milk production technology, its zootechnical and economic justification, advantages and disadvantages. Requirements for animals for the dairy farms acquisition. Zoo veterinary protection of farms.

Modern examples of the technological processes organization during milk production. Modeling of stream-phase organization of milk production technological process on a farm. Determination of the rhythm, tact and volume of work at the farm. Substantiation of the number of production periods and duration of stay of cows in them. Determining the need for farm stall places. Milk production cycle. Technological operations for different technological variants of

milk production, their expediency and rationalization. Operational and technological map of the process.

Content module 2. Optimization of technological processes in meat cattle breeding

Topic 3. The technological process of production in specialized cattle breeding. Productive, technological and economic features of specialized meat cattle. Creation and development of specialized meat cattle breeding in terms of Ukraine. Feeding and keeping of meat cows of different physiological state. Substantiation and organization of seasonal calving. Growing calves in the suckling period. Feeding and keeping the young calves in the first months after weaning. Growing heifers and calves. Organization of growing, fattening and feeding animals for meat. Ukrainian technology of meat cattle breeding. Organization of technological process of growing and fattening cattle with year-round stall maintenance. Features of feed base organization in highly mechanized, conventional farms and agrarian enterprises. Experience of the best farms in Ukraine and abroad on growing and fattening cattle. Estimation of economic efficiency of breeding of specialized meat cattle in different zones of Ukraine. Livestock breeding abroad. Technological peculiarities of growing young calves, milk production. Organization of growing and fattening cattle.

Topic 4. Energy-saving technologies for beef production in cattle breeding. Meat cattle keeping systems and methods. Buildings for keeping animals. Creation of high-performance pastures, extension of pasture period. Growing calves in the suckling period. Keeping young animals before, during and after weaning. Keep animals in the feed. Types and sex groups of cattle for fattening. The meat animals need for energy and nutrients. Feeding cattle, depending on their physiological condition, age and time of the year. Organizing a forage base in the specialized butchery. Water consumption rates and water supply requirements. Evaluation of the bitterns on their own efficiency and quality of offspring.

Topic 5. Economics and farm management of specialized livestock farming. Economy of specialized meat cattle. Principles of zoning of meat cattle, its intra-industry specialization and integration. Management principles for livestock farms. Developing and implementing a business plan. Biological and price cycles in meat cattle, factors that determine their profitability. Meat cattle financing and funding. Relationship between beef producers with their consumers, public state organizations. Pastures organization.

Content module 3. Optimization of technological processes in pig production

Topic 6. Streaming technology for pork production. Pig farm projects. Basic principles of the industry maintenance on an industrial basis. One-, two- and three-phase pig retention systems. Organization of pig reproduction. Feeding of young pigs. Technological parameters of fattening. Veterinary and sanitary measures. Manure removal and processing. Cattle breeding reproduction workshop. The system of breeding work.

Topic 7. Features of farming and peasant household.

Types and sizes of the farm. Event planning for a pig farm. Optimization and mechanization of production processes. Harvesting, storage and preparation of

forage for feeding. Reproduction of pigs. Development of the business plan main provisions. Calendar of basic farm work.

Content module 4. Optimization of technological processes in poultry farming

Topic 8. Technology of poultry production. Basic principles of organization and technological process scheme for unclosed and closed production cycles. Specialization and concentration of production. Types and sizes of egg and poultry companies. Technological charts and production maps of eggs and poultry meat. Production of food eggs in farms and peasant households. Economic efficiency of poultry production. Evaluation of the bird on the quality of the offspring.

Topic 9. Technology of food eggs production. Basic principles of food eggs production industrial technology. The main technological chains of industrial eggs production. Completing and keeping the parent flock. Forced molting of chickens and their importance in the food eggs production. Growing of young animals for the parental and industrial herds repairing. Maintenance and feeding of laying hens in the industrial flock. Feeding egg chickens. Sorting, storage and sale of eggs. Calculation of the movement of livestock chickens of industrial flocks and food eggs production. Calculation of the livestock chickens movement in the parent flock. Chickens breeding for the industrial flock completing. Drawing up a young animals growing technological schedule for the completing an egg chicken industrial flock. Determination of the live weight of a bird and the homogeneity of a herd.

Topic 10. Broiler chicken production technology. Importance of industrial broiler chicken production and its basic technological principles. Completing and keeping the parent flock of broilers. Incubation of eggs of meat chickens. Repairing young chicken growing. Characteristics of meat chickens production technological systems. Meat chickens feeding. Slaughter and processing of poultry. Technological aspects of increasing broiler productivity. Calculation of the number of broiler chickens at a poultry production enterprise. Calculation of the number of broiler chickens according to the different ways of growing them.

4. The structure of the educational discipline

Content modules and topics names	Amount of academic hours											
	Full-time study						Distant study					
	Total	Among them					Total	Among them				
		l	pr	lab	ind	tas		l	pr	lab	ind	tas
Module 1. Optimization of technological processes in dairy cattle												
Content module 1. Optimization of technological processes in dairy cattle												
Topic 1. Modeling of technological processes in animal husbandry.	14	6	6	-	-	2	12		2	-	-	10
Topic 2. Industrial technology of milk production in farms of different types.	16	6	6			4	12	2				10
Total with content module 1.	30	12	12	-	-	6	24	2	2			20
Module 2. Optimization of technological processes in meat cattle breeding												
Content module 2. Optimization of technological processes in meat cattle breeding												
Topic 3. The technological process of production in specialized cattle breeding.	10	4	4			2	14	2		-	-	12
Topic 4. Energy-saving technologies for beef production in cattle breeding.	12	4	4			4	12		2			10
Topic 5. Economics and farm management of specialized livestock farming.	8	2	2			4	10					10
Total with content module 2.	30	10	10			10	36	2	2	-	-	32
Module 3. Optimization of technological processes in pig production												
Content module 3. Optimization of technological processes in pig production												
Topic 6. Streaming technology for pork production.	14	6	6	-	-	2	12	2		-	-	10
Topic 7. Features of farming and peasant household.	16	6	6			4	12		2			10
Total with content module 3.	30	12	12	-	-	6	24	2	2	-	-	20
Module 4. Optimization of technological processes in poultry farming												
Content module 4. Optimization of technological processes in poultry farming												
Topic 8. Technology of poultry	12	4	4			4	12	2		-	-	10

production.												
Topic 9. Technology of food eggs production.	12	4	4			4	12		2			10
Topic 10. Broiler chicken production technology	6	2	2			2	12		2			10
Total with content module 4	30	10	10			10	36	2	4	-	-	30
Total amount of hours	120	44	44	-	-	32	120	8	10	-	-	102

5. Topics and lesson plan (full-time study)

No.	Topic name	Amount of hours
1	<p>Topic 1. Modeling of technological processes in animal husbandry.</p> <p>1. The concept of technology, technological and work processes, sketchy, working and operational modeling of processes in animal husbandry.</p> <p>2. Principles of technological process modeling.</p> <p>3. Technological scheme and organizational regimes of the process.</p>	6
2	<p>Topic 2. Industrial technology of milk production in farms of different types.</p> <p>1. Conditions that determine the efficiency of milk production on highly mechanized, conventional farms and agricultural enterprises.</p> <p>2. The essence of industrial milk production technology, its zootechnical and economic justification, advantages and disadvantages.</p> <p>3. Requirements for animals for dairy farms stocking. Zoo veterinary protection of farms.</p>	6
3	<p>Topic 3. The technological process of production in specialized cattle breeding.</p> <p>1. Productive, technological and economic features of specialized beef cattle.</p> <p>2. Creation and development of specialized meat cattle breeding in terms of Ukraine.</p>	4

	<p>3. Feeding and keeping of meat cows of different physiological state.</p> <p>4. Substantiation and organization of seasonal calving</p> <p>5. Growing calves in the suckling period.</p>	
4.	<p>Topic 4. Energy-saving technologies for beef production in cattle breeding.</p> <p>1. Meat cattle keeping systems and methods.</p> <p>2. Buildings for keeping animals.</p> <p>3. Creation of high-performance pastures, extension of pasture period.</p> <p>4. The need of meat animals for energy and nutrients.</p>	4
5	<p>Topic 5. Economics and farm management of specialized livestock farming.</p> <p>1. Economy of specialized meat cattle.</p> <p>2. Principles of zoning of meat cattle, its intra-industry specialization and integration.</p> <p>3. Management principles for livestock farms.</p>	2
6	<p>Topic 6. Streaming technology for pork production.</p> <p>1. Basic principles of the industry maintenance on an industrial basis</p> <p>2. One-, two- and three-phase pig retention systems.</p> <p>3. Cattle breeding reproduction workshop.</p> <p>4. The system of breeding work.</p>	6
7	<p>Topic 7. Features of farming and peasant household.</p> <p>1. Types and sizes of the farms.</p> <p>2. Planning of pig farm activities.</p> <p>3. Reproduction of pigs.</p>	6
8	<p>Topic 8. Technology of poultry production.</p> <p>1. Basic principles of organization and technological process scheme for unclosed and closed production cycles</p> <p>2. Specialization and concentration of production.</p> <p>3. Types and sizes of egg and poultry companies.</p>	4
9	<p>Topic 9. Technology of food eggs production.</p> <p>1. Basic principles of food eggs production industrial technology</p> <p>2. The main technological chains of industrial eggs production.</p> <p>3. Completing and keeping the parent flock.</p> <p>4. Forced molting of chickens and their importance in the food eggs production.</p>	4
10	<p>Topic 10. Broiler chicken production technology.</p> <p>1. Importance of industrial production of broiler chickens and</p>	2

	<p>its basic technological principles.</p> <p>2. Completing and keeping the parent flock of broilers.</p> <p>3. Incubation of eggs of meat chickens.</p> <p>4. Repairing young chicken growing.</p> <p>5. Feeding meat chickens.</p>	
	Total	44

6. Topics of laboratory classes (Full-time study)

No.	Topic name	Amount of hours
1	<p>Topic 1. Modeling of technological processes in animal husbandry.</p> <p>1. The rhythm and tact of the process, the volume of work, their importance in the organization of technological process.</p> <p>2. Principles, procedure for development and maintenance of technological documentation.</p>	6
2	<p>Topic 2. Industrial technology of milk production in farms of different types.</p> <p>1. Modeling of stream-phase organization of milk production technological process on a farm.</p> <p>2. Determination of the rhythm, tact and volume of work at the farm.</p> <p>3. Substantiation of the number of production periods and duration of stay of cows in them.</p> <p>4. Determining the need for farm stall places.</p> <p>5. Milk production cycle.</p> <p>6. Technological operations for different technological variants of milk production, their expediency and rationalization.</p> <p>7. Operational and technological map of the process.</p>	6
3	<p>Topic 3. The technological process of production in specialized cattle breeding.</p> <p>1. Feeding and keeping the young calves in the first months after weaning.</p> <p>2. Growing heifers and calves.</p> <p>3. Organization of growing, fattening and feeding animals for meat.</p> <p>4. Ukrainian technology of meat cattle breeding.</p> <p>5. Organization of technological process of growing and fattening cattle with year-round stall maintenance.</p>	4

4	<p>Topic 4. Energy-saving technologies for beef production in cattle breeding.</p> <ol style="list-style-type: none"> 1. Growing calves in the suckling period. 2. Keeping young animals before, during and after weaning. 3. Keep animals in the feed. 4. Types and sex groups of cattle for fattening. 5. Feeding cattle, depending on their physiological condition, age and time of the year. 	4
5	<p>Topic 5. Economics and farm management of specialized livestock farming.</p> <ol style="list-style-type: none"> 1. Developing and implementing a business plan. 2. Biological and price cycles in meat cattle, factors that determine their profitability. 3. Pastures organization. 	2
6	<p>Topic 6. Streaming technology for pork production.</p> <ol style="list-style-type: none"> 1. Organization of pig reproduction. 2. Feeding of young pigs. 3. Technological parameters of fattening. 	6
7	<p>Topic 7. Features of farming and peasant household.</p> <ol style="list-style-type: none"> 1. Harvesting, storage and preparation of forage for feeding. 2. Development of the business plan main provisions. 3. Calendar of basic farm work. 	6
8	<p>Topic 8. Technology of poultry production.</p> <ol style="list-style-type: none"> 1. Technological charts and production maps of eggs and poultry meat. 2. Economic efficiency of poultry production. 3. Evaluation of the bird on the quality of the offspring. 	4
9	<p>Topic 9. Technology of food eggs production.</p> <ol style="list-style-type: none"> 1. Calculation of the movement of livestock chickens of industrial flocks and food eggs production. 2. Calculation of the livestock chickens movement in the parent flock. 3. Drawing up a young animals growing technological schedule for the completing an egg chicken industrial flock. 4. Determination of the live weight of a bird and the homogeneity of a herd. 	4
10	<p>Topic 10. Broiler chicken production technology.</p> <ol style="list-style-type: none"> 1. Calculation of the number of broiler chickens at a poultry production enterprise. 	2

	2. Calculation of the number of broiler chickens according to the different ways of growing them. 3. Characteristics of meat chickens production technological systems.	
	Total	44

**7. Individual work
(full-time study)**

No.	Topic name	Amount of hours
1	Topic 1. Modeling of technological processes in animal husbandry. 1. Organization of technological process management. 2. Technological scheme and organizational modes of the process.	2
2	Topic 2. Industrial technology of milk production in farms of different types. 1. Modern examples of the technological processes organization during milk production.	4
3	Topic 3. The technological process of production in specialized cattle breeding. 1. Features of feed base organization in highly mechanized, conventional farms and agrarian enterprises. 2. Experience of the best farms in Ukraine and abroad on growing and fattening cattle. 3. Estimation of economic efficiency of breeding of specialized meat cattle in different zones of Ukraine. 4. Livestock breeding abroad. Technological peculiarities of growing young calves, milk production. Organization of growing and fattening cattle.	2
4	Topic 4. Energy-saving technologies for beef production in cattle breeding. 1. Organizing a forage base in the specialized butchery. 2. Water consumption rates and water supply requirements. 3. Evaluation of the bitterns on their own efficiency and quality of offspring.	4
5	Topic 5. Economics and farm management of specialized livestock farming. 1. Meat cattle financing and funding. 2. Relationship between beef producers with their consumers, public state organizations.	4
6	Topic 6. Streaming technology for pork production.	2

	1. Pig farm projects. 2. Manure removal and processing. 3. Veterinary and sanitary measures.	
7	Topic 7. Features of farming and peasant household. 1. Optimization and mechanization of production processes.	4
8	Topic 8. Technology of poultry production. 1. Production of food eggs in farms and peasant households.	4
9	Topic 9. Technology of food eggs production. 1. Growing of young animals for the parental and industrial herds repairing. 2. Sorting, storage and sale of eggs.	4
10	Topic 10. Broiler chicken production technology 1. Slaughter and processing of poultry. 2. Technological aspects of increasing broiler productivity.	2
	Total	32

8. Training methods

1. Training methods according to the source of knowledge:

1.1. Verbal: narrative, explanation, lecture, briefing.

1.2. Visual: demonstration, illustration.

1.3. Practical: laboratory method, practical work.

2. Training methods according to the nature of cognition logic.

2.1. Analytical.

3. Training methods according to the nature and level of independent mental activity of post-graduate students.

3.1. Problem (problem-informative).

3.3. Research.

3.4. Explanatory-demonstrative.

3.5. Personalized learning.

3.6. Differentiated instruction.

3.7. Learning through request.

4. Active teaching methods – use of technical training means, occupation on production, use of training and control tests, use of basic lecture notes.

5. Interactive learning technologies – use of multimedia technologies.

9. Control methods

1. Rating control over a 100-point ECTS rating scale.

2. Conducting intermediate control during the semester (intermediate certification).

3. Multicriteria assessment of post-graduate students' current work:

- the level of knowledge, demonstrated in practical and laboratory classes;
- activity during the discussion of the issues, raised in the class;
- results of practical works' implementation and protection;
- individual study of the topic as a whole or certain issues;
- test results.

4. Assessment during project protection and credit is carried out by a collegial group of teachers by creating a commission.

10. The distribution of points that post-graduate students receive

Ongoing testing and independent work					Total for modules and IT	Amount
CM1-16 points	CM2-18 points	CM3-16 points	CM4-18 points	IT		
T1 – T2	T3 – T5	T6 – T7	T8 – T10	30	100 (70+30)	100

Rating scale: national and ECTS

Amount of points for all kinds of educational activity	Marks ECTS	Marks by national scale	
		for exam, course project (work), practice	for credit
90 – 100	A	excellent	counted
82-89	B	good	
74-81	C		
64-73	D	satisfactory	
60-63	E		
35-59	FX	unsatisfactory, with the possibility of repassing	uncounted, with the possibility of repassing
1-34	F	unsatisfactory, without the possibility of repassing	uncounted, without the possibility of repassing

11. Methodological support

1. Kostenko V. I. Workshop on cattle breeding and technology of milk and beef production. – K .: Urozhai, 2006. – 256 p.
2. Technology of poultry production. Origin and performance of a bird. Methodical instructions for practical training. – Sumy, 2015, pp., libr. 40.
3. Technology of poultry production. The structure of the visceral system of birds. Methodical instructions for practical training. – Sumy, 2015, pp., libr. 40.
4. Technology of poultry production. The structure of the integrating system of birds. Methodical instructions for practical training. – Sumy, 2015, pp., libr. 40.

5. Technology of poultry production. The structure of the somatic system of birds. Methodical instructions for practical training. – Sumy, 2015, pp., libr. 40.

12. Recommended literature

Basic

1. Yu.D. Ruban, S.Yu. Ruban. Technology of milk and beef production – Kharkiv, Espada, 2011, 793 p.
2. Yu.D. Ruban. Technology of milk and beef production – Kharkiv, Espada, 2015, 572 p.
3. Farmer: Basic Level – Sumy, University Book, 2013. – 458 p.
4. Farmer: Professional Level – Sumy, University Book, 2014. – 601 p.
5. Technology of production of pig production / Zasukha Y.V., Nagaevich V.M., Povod M.G., Baranovsky D.I. et al. Vinnitsa. New Book, 2011, 333 p.
6. Pig production (monograph) / Voloshchuk V.M., Rybalko V.P., Povod M.G. et al. – Kyiv Agrarian Science, 2014, 588 p.
7. Pig-breeding technology / D.I. Baranovsky, V.I. Gerasimov, V.M. Nagaevich et al. – Kharkiv: Espada, 2011. p. 2011.
8. Bogolyubsky S.I. Breeding of poultry. – M.: Agropromizdat, 2001. – 285 p.
9. Bozhko P.E. Eggs and poultry production technology on the industrial basis. - M.: Kolos, 2004. - 366 p.

Auxiliary

1. Genetics, breeding and biotechnology in cattle breeding / M.V. Zubets, V.P. Burkat, Yu.F. Melnik et al. - K. : BMP, 2007. – 722 p.
2. Ruban Yu.D. Livestock and milk and beef production technology. 2003. – 386 p.
3. Ruban Yu.D. Breeds, breeding process and animal breeding. – K.: Agrarian Science, 2006. – 380 p.
4. Instructions for boning dairy cattle. K. : Urozhai, 2004. – 76 p.
5. Pork production and technology of pork production / V.I. Gerasimov, L.M. Tsitsyursky, D.I. Baranovsky et al. – Kharkiv: Espada, 2003. – 448 p.
6. Gerasimov V.I., Kovalenko B.P, Nagaevich V.M., Pohodnya V.M. et al. Handbook of pork production. – Kharkiv.: Espada, 2001. – 336 p.
7. Kovalev L.Y., Fateev V.N. Breeds, lines and crosses of farm poultry. – M.: Kolos, 2003.
8. Kochish I.I. Breeding in poultry farming. – M.: Kolos, 2002.

Scientific and research journals:

Offer;
Effective animal husbandry
Milk and farm
Agroexpert
About cows

Electronic resources

www.propozitsiya.com

www.agroexpert.ua
[www. magazine.milkua.info](http://www.magazine.milkua.info)
agroyug.ru/agro-2/nomer/arhiv.html
latifundist.com
kurkul.com
www.poettinger.at
www.gea-ukraine.com
bratslav.com
ukrstat.gov.ua
sumystat.sumy.ua