

Information resources

- [Aquarium snails: main species and names // Zoo.net.ua](#)
- [Cancer in the aquarium // Zoo.net.ua](#)

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Veterinary Medicine
Department of Virology, Pathanatomy and Poultry Diseases

Work program (syllabus) of the educational component

Professional selective discipline 8

Diseases of aquarium fish and aquaculture

is selective

(mandatory / optional)

It is implemented within the educational program

"Veterinary"

(name)

in specialty 211 " Veterinary Medicine "

(code, name)

on second (master's) level of higher education

Sumy - 2024

Developer: [Signature] **Petrov R.V., doctor of science, professor, head department**

(signature)

(surname, initials) (degree and title, position)

Considered, approved and approved at the meeting of the department virology, pathology and poultry <small>(name of department)</small>	protocol dated June 5, 2024 No. 17	
	Head department	<u>[Signature]</u> Petrov R.V. (signature) (surname, initials)

Agreed:

Guarantor of the educational program: [Signature] **R.V. Petrov**
(signature) (surname)

Dean of the faculty where the educational program is implemented

[Signature] **Nechiporenko O.L.**
(signature) (surname)

Review of the work program (attached) provided: [Signature]
(surname)

[Signature]
(surname)

Methodist of the Education Quality Department, licensing and accreditation [Signature] **[Signature]**
(signature) (surname)

Registered in the electronic database: date: 06.07 2024.

Information on revision of the work program (syllabus):

The academic year in which the changes are made	The number of the annex to the work program with a description of the changes	The changes were reviewed and approved		
		Date and number of the protocol of the meeting of the department	Head of Department	Guarantor of the educational program

GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	The name is OK	Aquarium science			
2.	Faculty/department	Faculty of Veterinary Medicine / Department of Virology, Pathanatomy and Poultry Diseases			
3.	The status is OK	Selective			
4.	Program/Specialty (programs), the component of which is OK for (to be filled in for mandatory OK)	211 Veterinary medicine.			
5.	OK can be offered for (to be filled in for selective OKs)				
6.	NRK level	7th level			
7.	Semester and duration of study	1 semester, 15 weeks			
8.	Number of ECTS credits	5.0			
9.	The total number of hours and their distribution	Contact work (class)			Independent work
		Lectures	Practical/seminar	Laboratory	
		-	-	4	
10.	Language of education	Ukrainian			
11.	Teacher/Coordinator of the educational component	Petrov R.V.			
11.1	Contact Information	Corp. 3 , room 71, Phone: 380 66 3927928 ; viber 380 66 3927928 romanpetrov1978@gmail.com			
12.	General description of the educational component	The educational component studies the activities related to the modeling of the ecosystem in a closed artificial reservoir, namely the creation of aquariums, the substantiation of requirements for water, plants, fish and other hydrobionts. Considers the issue of maintaining and caring for an aquarium, considers the issue of treatment and prevention of fish diseases of various etiologies.			
13.	The purpose of the educational component	<p>The purpose of teaching the educational discipline " Aquariumistics " is the formation of a system of special knowledge, as well as the expansion and deepening of professional competences acquired during the study of normative disciplines , namely:</p> <ul style="list-style-type: none"> • Ability to conduct clinical research in order to formulate conclusions about the condition of animals or establish a diagnosis. • Ability to organize and conduct laboratory and special diagnostic studies and analyze their results. • Ability to plan, organize and implement measures for the treatment of animals of various classes and species suffering from non-contagious, infectious and invasive diseases 			
14.	Prerequisites for studying OK, connection with other educational components of OP	The educational component is based on the study of OK: Internal diseases of animal diseases Epizootology and infectious diseases			

15.	Policy of academic integrity	Any manifestations of academic dishonesty are not allowed during the study of OK. <u>Plagiarism check algorithm systems</u> are tools for combating violations of academic integrity . In case of violations, the response takes place in accordance with the regulatory documentation regarding the academic integrity of the participants of the educational process at the Sumy National University (https://snau.edu.ua/viddil-zabezpechennya-yakosti-osviti/zabezpechennya-yakosti-osviti/akademichna-dobrochesnist/). If a violation of academic integrity is detected, the completed task is not counted and sent for re-execution.
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2. LEARNING RESULTS UNDER THE EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Study results for OK: After studying the educational component, the student is expected to be able to analyze and apply in practice	Program learning outcomes, which are aimed at the achievement of the OK (indicate the number according to the numbering given in the OP)							How RND is estimated
	PRN 1	PRN 2	PRN 3	PRN 6	PRN 7	PRN 10	PRN 10	
DRN 1. Introduction to aquarism . Basic concepts and history.	+			+		+		- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 2. Methods of controlling abiotic factors of the aquarium	+	+		+	+	+	+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 3 Aquarium plants	+		+	+	+	+	+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work

DRN4. Kinds aquarium fish	+		+	+	+	+	+	+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 5. Infectious diseases of fish.	+	+		+				+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 6. Invasive fish diseases. Non-bacterial diseases of fish.	+	+		+				+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 7. Hydrobionts .	+							+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 8. Aquarium decoration. Main styles and directions	+	+						+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work

DRN 9. Fish feeding. Feed requirements. Fish breeding. Breeding of young fish.	+	+		+				+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work
DRN 10. Garden pond. Equipment for a garden pond.	+	+		+				+	- survey of theoretical questions, - performance of tasks in laboratory-practical classes, - testing, performance of tasks of independent work

3. CONTENTS OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be considered within the topic	Distribution within the general limits time budget		Recommended Books
	Auditory work		
	Lk	Lab with.	
Topic 1. Introduction to aquarium science . Basic concepts and history. History of aquarium science . Aquarium science as a hobby and commercial direction. Choosing an aquarium, its manufacture and installation.	2	12	4,5,18,19
Topic 2. Methods of controlling abiotic factors of the aquarium Lighting, filtration, water heating. Control methods. The most important physical indicators of water, methods of control and correction. The most important chemical indicators of water, methods of control and correction. Preparation of water for the aquarium		18	2,6,7,18,19
Topic 3. Aquarium plants. Plants in the aquarium, species. Mineral nutrition, fertilizers. The number of plants in the aquarium. Reproduction of plants. Diseases of aquarium plants. Selection of plants for the aquarium, their compatibility.		18	2,6,7,18,19
Topic 4. Types of aquarium fish. Aquarium fish of the herring series . Aquarium fish of the Mormyropodidae	2	16	1,4,6,11,12,18,19

family . Aquarium fish of the carp family . Aquarium fish of the carp family . Aquarium fish of the order mullet-like				
Topic 5. Infectious diseases of fish. Diseases of viral etiology. Diseases of bacterial etiology. Diseases of fungal etiology.			18	4,12,18,19
Topic 6. Invasive fish diseases. Non-infectious diseases of fish. Protozoa . Nematodes . Cestodiasis. Methods of diagnosis and treatment. Non-communicable diseases.			16	1,4,13,18,19
Topic 7 Aquarium hydrobionts . Clams. Shellfish. Selection. Care. Diseases of hydrobionts.			10	11,12,18,19
Topic 8. Aquarium decoration. Main styles and directions . Order of decoration. Requirements for materials and lighting. Types of artificial aquarium lighting. The main styles of decorating an aquarium.			10	3,18,19
Topic 9. Fish feeding. Feed requirements. Fish breeding. Breeding of young fish. Types of fodder. Sanitary requirements for fodder. Feeding norms. Creation of conditions for breeding aquarium fish. Peculiarities of feeding and caring for young fish.			10	2, 21, 22
Topic 10. Garden pond. Equipment for a garden pond. Choosing a place for a garden pond. Conditions and equipment. Population of hydrobionts of artificial reservoirs.			18	3, 18, 19
In total	0	4	146	150

4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work to be carried out by the teacher during classroom classes . consultations)	Number of hours	Learning methods (what types of learning activities should be performed by the student independently)	Number of hours
DRN 1. Introduction to aquarium . Basic concepts and history .	Teaching methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.	2	Learning methods by source of knowledge: <i>Verbal:</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, supporting notes), <i>Visual:</i> observation. Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)	12
DRN 2. Methods of controlling abiotic factors of the aquarium	Teaching methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.		Learning methods by source of knowledge: <i>Verbal:</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual:</i> observation. Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)	18
DRN 3	Teaching methods by source of knowledge:	2	Learning methods by source of knowledge:	16

Aquarium plants	<p><i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.</p> <p><i>Visual:</i> demonstration, illustration, observation</p> <p>Active methods: (use of technical teaching aids, use of educational and control tests)</p> <p>Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p><i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation.</p> <p>Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>).</p> <p>Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies).</p> <p>Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	
DRN4 Kinds aquarium fish	<p>Teaching methods by source of knowledge:</p> <p><i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.</p> <p><i>Visual:</i> demonstration, illustration, observation.</p> <p>Active methods: (use of technical teaching aids, use of educational and control tests)</p> <p>Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge:</p> <p><i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation.</p> <p>Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>).</p> <p>Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies).</p> <p>Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	18
DRN 5. Infectious diseases of fish.	<p>Teaching methods by source of knowledge:</p> <p><i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.</p> <p><i>Visual:</i> demonstration, illustration, observation.</p> <p>Active methods: (use of technical teaching</p>		<p>Learning methods by source of knowledge:</p> <p><i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation.</p> <p>Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method,</i></p>	16

	<p>aids, use of educational and control tests)</p> <p>Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p><i>deductive method, translational method</i>).</p> <p>Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies).</p> <p>Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	
DRN 6. Invasive fish diseases. Non-infectious diseases of fish.	<p>Teaching methods by source of knowledge:</p> <p><i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.</p> <p><i>Visual:</i> demonstration, illustration, observation.</p> <p>Active methods: (use of technical teaching aids, use of educational and control tests)</p> <p>Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge:</p> <p><i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation.</p> <p>Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>).</p> <p>Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies).</p> <p>Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	10
DRN 7. hydrobionts . .	<p>Teaching methods by source of knowledge:</p> <p><i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction.</p> <p><i>Visual:</i> demonstration, illustration, observation.</p> <p>Active methods: (use of technical teaching aids, use of educational and control tests)</p> <p>Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge:</p> <p><i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation.</p> <p>Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>).</p> <p>Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning</p>	10

			technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)	
DRN8. Aquarium decoration. Main styles and directions	<p>Teaching methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge: <i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation. Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	10
DRN 9. Fish feeding. Feed requirements. Fish breeding. Breeding of young fish.	<p>Teaching methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge: <i>Verbal :</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual :</i> observation. Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	10

DRN 9. Garden pond. Equipment for a garden pond.	<p>Teaching methods by source of knowledge: <i>Verbal:</i> story, explanation, conversation (heuristic and reproductive), lecture, instruction. <i>Visual:</i> demonstration, illustration, observation. Active methods: (use of technical teaching aids, use of educational and control tests) Interactive teaching methods: (use of multimedia technologies, spreadsheets.</p>		<p>Learning methods by source of knowledge: <i>Verbal</i> working with a book (reading, retelling, writing, taking notes, making tables, graphs, reference notes), <i>Visual</i> observation. Learning methods by the nature of the logic of cognition (<i>analytical, synthesis methods, and the inductive method, deductive method, translational method</i>). Active methods (brainstorming, solving crosswords, debates, round tables, binary classes, business and role-playing games, group studies). Interactive learning technologies (use of multimedia technologies, dialogic learning, student cooperation (cooperation)</p>	10
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5. EVALUATION BY THE EDUCATIONAL COMPONENT

5.1. Diagnostic assessment (specified as necessary)

5.2. Summative assessment

5.2.1. To assess the expected learning outcomes, it is provided

No	Methods of summative assessment	Points / Weight in the overall assessment	Compilation date
1.	Thematic survey	20 points / 20%	Weekly
2.	Performance of laboratory- practical tasks classes	20 points / 20%	According to the schedule
3.	Testing	15 points / 15%	During 7-8 weeks
4.	A report with a presentation on the topic of independent study of the discipline	15 points / 15%	According to the module delivery schedule
5.	Exam	30 points / 30%	According to the schedule

5.2.2. Evaluation criteria

Component ¹	Unsatisfactorily	Satisfactorily	Fine	Perfectly ²
Thematic survey	< 12 points	12-15 points	15-18 points	20 points
	The student can reproduce only individual	Most of the requirements are met, but individual components are missing or insufficiently disclosed,	All requirements of the task have been fulfilled	All the requirements of the task were fulfilled, creativity, thoughtfulness was

¹ Specify the summative assessment component

² Specify the distribution of points and the criteria determining the level of assessment

	fragments from the course.	there is no analysis of other approaches to the issue		demonstrated, and an own solution to the problem was proposed
Performance of laboratory-practical tasks classes	<12 points	12-15 points	15-18 points	20 points
	Task requirements not met	Most of the tasks are performed using basic theoretical principles, the student has difficulty explaining the rules for solving laboratory-practical tasks. The performance of individual control tasks is significantly formalized, there is no deep understanding of the work	The student has mastered the basic material, and understands and performs laboratory-practical tasks, has suggestions regarding the direction of their solutions. Understands the main provisions that are decisive in the course, can solve similar tasks to those discussed with the teacher, but allows a small number of inaccuracies.	The applicant implements the theoretical material of the discipline while performing laboratory and practical work, is able to analyze and compare the results obtained on the basis of the knowledge, skills, and practical skills acquired from this discipline
Multiple choice test	≤ 5 points	6-9 points	10-13 points	14-15 points
	The student gives the correct answer to several questions (≤ 33% of correct answers).	The student has certain knowledge provided for in the discipline program, possesses the main provisions being studied and gives the correct answer to several questions (34-59% of correct answers).	In general, the student has a good command of the material, knows the main provisions of the material, and gives the correct answer to several questions (60-89% of correct answers).	The student demonstrates full and solid knowledge of the educational material in the amount corresponding to the discipline program, answers the test questions correctly (90-100% of correct answers).
Preparation and presentation report of self-processed material	<9 points	10-19 points	20-39 points	40-45 points
	The student lacks complete understanding of the subject material. The student did not complete the independent processing of the material.	Despite the fact that the student completed the program of the academic discipline, but individual components were missing or insufficiently studied, the student worked passively.	Knows the main provisions that are of decisive importance at performing independent work / individual tasks. Errors in the answers are not significant.	All requirements and tasks were fulfilled, creativity and thoughtfulness were demonstrated, and an own solution to the problem was proposed.

5.3. Formative assessment:

To assess the current progress in learning and understand the directions for further improvement is provided

No	Elements of formative assessment	Date
1	Verbal feedback after studying topics 1,2,3,4,5,6,7,8	2,4,6,8,10,12,14,15 weeks of the semester
2	Written feedback after studying topics 1-3, 4-8	8.15 weeks of the semester
3	Written feedback from the teacher while working on laboratory-practical tasks	Within 1 week of execution
4	Verbal feedback from the teacher after a report with a presentation on the topic of independent study of the discipline	During classes

6. EDUCATIONAL RESOURCES (LITERATURE)

Recommended Books

Basic

1. Beginner aquarist training help / S. V. Budnik, A. M. Kolosok; Eastern Europe national Акваріуміст-початківець: навч. посіб. / С. В. Буднік, А. М. Колосок; Східноєвроп. нац. ун-т ім. Лесі Українки, Пед. ін-т. — Вид. 2-ге, випр. та допов. — Луцьк: Вежа-Друк, 2017. — 155 с.: іл., табл., портр.; 21 см. — Бібліотр. с. 148—152 (58 назв). — 300 пр. — ISBN 978-966-940-079-6
2. Джеремі Г'ян (2005). The Complete Guide to Setting Up and Maintaining an Aquarium. Octopus Publishing Group 256с.
3. Шереметьян І. І. Акваріумні риби. — К.: Рад. шк., 1989. — 221 с. ISBN 5-330-00394-6

Auxiliary

1. Activated Carbon In Aquarium | Aquariums Life. web.archive.org. 2 травня 2015. Архів оригіналу за 2 травня 2015. Процитовано 5 липня 2021.
2. Alderton, David (2005) *Encyclopedia of aquarium & pond fish* (вид. 1st American ed). New York: Dorling Kindersley. ISBN 0-7566-0941-0. OCLC 58012653. Архів оригіналу за 13 лютого 2007..
3. Antychowicz, Jerzy (1990). *Choroby ryb akwariowych*. Warszawa: Państwowe Wydaw. Rolnicze i Lesne. ISBN 83-09-01449-X. (XCLC 749420823.
4. Aquarium Plants Deficiency | Aquariums Life. web.archive.org. 21 квітня 2015. Архів оригіналу за 21 квітня 2015.
5. Category: Diseases - The Free Freshwater and Saltwater Aquarium Encyclopedia Anyone Can Edit - The Aquarium Wiki. web.archive.org. 13 травня 2015. Архів оригіналу за 13 травня 2015.
6. FDA: See 525.825 Vinegar, Definitions — Adulteration with Vinegar Fels (CPG 7109.22)
7. How To Quarantine Aquarium Fish And Invertebrates | Aquariums Life. web.archive.org. 15 червня 2015. Архів оригіналу за 15 червня 2015.
8. Lukowicz von M. Experiments oa first feeding of cam fry with alevon and freeze-dried fish. — EIFAC Technical paper, 1979, № 35. Suppl. 1. — p.94-99.
9. Прост, Марія (1989). *Choroby ryb: podrecznik akademicki* (вид. Wyd. 2, popr. i uzup). Warszawa: Państwowe Wydawnictwo Rolnicze i Lesne. ISBN 83-09-01335-3. OCLC 749289583.
10. Свтушенко М. Ю. Ефективність використання стартового корму, виготовленого з пібриду червоного каліфорнійського черв'яка, для личинок риб // Науковий вісник Національного університету біоресурсів і природокористування України. Серія: Технологія виробництва і переробки продукції тваринництва. Збірник наукових праць. — 2011, Вип. 160, ч.1
11. Рудь М. П. Акваріум школяра. -К.: Рад.шк., 1990. -64с. ISBN 5-330-01196-5
12. Советы по ведению приусадебного хозяйства / Ф. Я. Попович, Б. К. Гапоненко, Н. М. Коваль и др.; Под ред. Ф. Я. Поповича. Киев: Урожай, 1985. с.664, ил.