



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Scienze Agrarie, Alimentari e Forestali		
<b>ACADEMIC YEAR</b>	2019/2020		
<b>MASTER'S DEGREE (MSC)</b>	MEDITERRANEAN FOOD SCIENCE AND TECHNOLOGY		
<b>INTEGRATED COURSE</b>	ANIMAL FOOD AND FISHERIES - INTEGRATED COURSE		
<b>CODE</b>	20213		
<b>MODULES</b>	Yes		
<b>NUMBER OF MODULES</b>	2		
<b>SCIENTIFIC SECTOR(S)</b>	AGR/19, BIO/07		
<b>HEAD PROFESSOR(S)</b>	MESSINA CONCETTA MARIA	Professore Ordinario	Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	MESSINA CONCETTA MARIA	Professore Ordinario	Univ. di PALERMO
	DI GRIGOLI ANTONINO	Professore Associato	Univ. di PALERMO
<b>CREDITS</b>	9		
<b>PROPAEDEUTICAL SUBJECTS</b>			
<b>MUTUALIZATION</b>			
<b>YEAR</b>	1		
<b>TERM (SEMESTER)</b>	2° semester		
<b>ATTENDANCE</b>	Not mandatory		
<b>EVALUATION</b>	Out of 30		
<b>TEACHER OFFICE HOURS</b>	<p><b>DI GRIGOLI ANTONINO</b></p> <p>Monday 10:00 12:00 Area Zootechnia - Dipartimento Scienze Agrarie, Alimentari e Forestali (Edificio 4 - Ingresso G - Stanza 70)</p> <p>Wednesday 10:00 12:00 Area Zootechnia - Dipartimento Scienze Agrarie, Alimentari e Forestali (Edificio 4 - Ingresso G - Stanza 70)</p> <p><b>MESSINA CONCETTA MARIA</b></p> <p>Monday 13:00 14:00 diSTeM: Via archirafi o Vle delle Scienze Ed 16, da concordare via email col docente</p>		

**DOCENTE:** Prof.ssa CONCETTA MARIA MESSINA

<b>PREREQUISITES</b>	Basic knowledge of the production chains of animal food and fishery, aquaculture and of the aspects related to the quality of the respective products.
<b>LEARNING OUTCOMES</b>	<p>Knowledge and ability to understand the relationships between environmental, physiological and supply chain factors on the state and quality of animal and fish production, with particular regard to sustainability issues.</p> <p>Ability to apply knowledge and understanding - The course aims to make the student able to assimilate and critically rework the knowledge acquired, aimed at understanding the logic in terms of metabolic interrelations and adaptations to the environment with effects on production and quality.</p> <p>Autonomy of judgement Students are guided to learn in a critical and responsible way all that is explained to them in the classroom and to enrich their own judgement skills through the discussion in the classroom of scientific issues of widespread media coverage.</p> <p>Communication skills The course aims to develop the student's ability to clearly and rigorously present the knowledge acquired. At the end of the course, the student must be able to enunciate in a correct way and with adequate vocabulary definitions, problems and mechanisms concerning the content of the course itself.</p> <p>Learning ability The learning ability will be monitored throughout the course through participatory discussion in the classroom. The course aims to develop learning skills to undertake professional activities in the disciplines related to food sciences and technologies.</p>
<b>ASSESSMENT METHODS</b>	<p>The verification of learning is based on a single oral test carried out in the same exam session for the two modules. The test consists of an interview in which the student must answer a minimum of six questions aimed at ascertaining the skills acquired in accordance with the expected learning outcomes, i.e. knowledge and understanding of the topics covered, the ability to apply knowledge and interpretation of the results that follow, in addition to the property of language and mastery of exposure.</p> <p>The exam is evaluated with a final grade in thirtieths determined as the weighted average of the grades attributed to the individual modules for which, in turn, the student's participation in the lessons is positively taken into account.</p> <p>In order to pass the exam, and thus obtain a grade higher than 18/30, the student must demonstrate a minimum level of competence and sufficient exhibition capacity. The lack of an acceptable knowledge of the subjects results in an insufficient evaluation. The maximum score (30/30 cum laude) is achieved by the student who has participated assiduously in the lessons and demonstrates to have reached in an excellent way the skills and abilities provided.</p>
<b>TEACHING METHODS</b>	lectures in the classroom and practical, workshop and seminars

## MODULE ANIMAL FOOD QUALITY

*Prof. ANTONINO DI GRIGOLI*

### SUGGESTED BIBLIOGRAPHY

Material used and discussed during the lessons (available on file.pdf).

Park Y.W., Haenlein G.F.W.. Milk and dairy products in human nutrition: production, composition and health. Wiley- Blackwell Publication.

Warriss P.D.. Meat science: an introductory text. Wallingford, CAB International.

<b>AMBIT</b>	21007-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	45
<b>COURSE ACTIVITY (Hrs)</b>	30

### EDUCATIONAL OBJECTIVES OF THE MODULE

Objective of this course is to impart knowledge about the aspects related to product qualification for the different production chains of animal product.

The parameters that define the quality of milk, meat and eggs will be described, explaining the main factors that can cause variations.

The methods and procedures for detecting and measuring the quality of animal products will also be outlined.

## SYLLABUS

Hrs	Frontal teaching
2	Definition of quality of animal products (milk, meat, eggs) and factors involved in their determination.
2	Quality of organic animal products and parameters for measuring the ethical quality based on animal welfare and environmental sustainability.
2	Methods for assessing the quality of food of animal origin. Animal products and proper nutrition.
3	The quality of milk for direct consumption and dairy processing. Evaluation of main parameters that define the milk quality of livestock animals.
3	Payment of milk according to quality. Influence of production systems on the quality of milk and dairy products.
1	Certification systems for dairy products.
2	Muscle structure and biochemistry. Effects of slaughtering and post-mortem treatments on meat quality.
3	Evaluation systems of chemical, nutritional, organoleptic, technological and sensorial quality of the meat of livestock animals.
2	Carcass cutting and marketing. Traceability and labeling of meat products according to current legislation.
2	Commercial classification of eggs and quality requirements of the shell, yolk and albumen according to the farming system.
Hrs	Practice
8	Laboratory activities for evaluation of animal products. Farms technical visits.

## MODULE FISHERY RESOURCES AND UTILIZATION

*Prof.ssa CONCETTA MARIA MESSINA*

### SUGGESTED BIBLIOGRAPHY

State of World fisheries and aquaculture, 2018. FAO

Alasalvar C., Miyashita K., Shahidi F., Wanasundara U. Handbook of seafood quality, safety and health applications. Wiley-Blackwell, Chichester, West Sussex, UK, 2010.

Lie Ø. (Ed.), Improving farmed fish quality and safety, Woodhead Publishing Limited, Cambridge, UK, 2008.

Pubblicazioni scientifiche

<b>AMBIT</b>	21007-Attività formative affini o integrative
<b>INDIVIDUAL STUDY (Hrs)</b>	90
<b>COURSE ACTIVITY (Hrs)</b>	60

### EDUCATIONAL OBJECTIVES OF THE MODULE

Starting from the extreme importance that seafood products have in the Mediterranean diet and economy, the course explores issues of growing importance at international and regional level: the close correlation between sustainable use of fish resources and traceability, product quality, consumer safety and limitation of environmental impact will be highlighted. The presentation will include the fishery resources of artisanal and industrial fishing in the Mediterranean, marine and inland aquaculture, integrated multitrophic aquaculture and implementation strategies aimed at their sustainable use and at improving competitiveness on international markets.

The effects of abiotic and biotic factors on product characteristics will be taken into account: from the effect of climate change to the effect of mating methods on product quality.

The new frontiers of seafood will be reviewed: from the consumption of plankton to ready-to-eat processed products, passing through algae.

Strategies to enhance the value of the catch will be examined:

- new processing techniques, both to improve environmental sustainability and to diversify production;
- enhancement of non-food resources and processing waste of fish products for the production of marine bioactive molecules (omega-3, chitin, chitosan, astaxanthin, polyphenols), functional and nutraceutical foods, able to support virtuous paths of circular economy.

It will contribute to the training of the graduates on aspects of quality of fish products that go beyond those of a purely hygienic-sanitary (to be understood as pre-requisites): quality commodity, nutritional, dietary, sensory, as well as freshness quality. Finally, the student will also acquire the ability to apply specific species patterns of product quality assessment.

## SYLLABUS

Hrs	Frontal teaching
3	Marine and aquatic edible resources: general overview of resources with a focus on the Mediterranean. Analysis of the main categories of supply chains and products and the sustainability of their production systems
3	The resources of artisanal and industrial fishing: sustainability and differentiation of their quality. Role in the Mediterranean diet.
3	Non-target species, ancillary species and poor fish: role in the diet and enhancement strategies to promote food biodiversity and improve sustainability
3	strategies to enhance and improve sustainability through innovative processing techniques. From traditional Mediterranean products (bottarga) to smart packaging
3	Aquaculture products: sustainability, quality and their role in the diet, traditional and innovative species and strategies for enhancement and innovation
3	Integrated multitrophic aquaculture and combined fish-molluscs-algae production as a strategy for improving sustainability and producing value-added nutritional components.
3	New frontiers in seafood: seaweed, plankton
3	Effect of natural, environmental and supply chain factors on product characteristics: effect of climate change on the state and quality of fish resources,
3	Effect of species-specific and physiological factors on production and quality
2	effect of slaughtering methods on quality
3	Description of the attributes that characterize resources, their origin and the production system
3	Description of the attributes that characterize resources, their origin and the production system: nutritional parameters, the new LARN (Recommended Energy and Nutrient Intake Levels) as a prerequisite for understanding the range of coverage of human needs on average allowed by fish products.
2	Technological parameters: instrumental measurements to support and/or integrate sensory parameters (water retention capacity, texture or consistency, colour): operating modes of the instruments most commonly used and any correlations between the values provided by them and sensory evaluations.
2	Enhancement of fishery resources as a strategy to improve sustainability and diversify production: production of functional foods and recovery of bioactive molecules from processing waste
2	Nutritional indicators to support product traceability: the example of fatty acids as fingerprints.

1	New rules of labelling for sustainability
<b>Hrs</b>	<b>Practice</b>
6	training on species identification and sensory analysis
<b>Hrs</b>	<b>Others</b>
6	Visit to fish processing plants: bottarga, canned tuna, sardines, smoked products
6	Visit aquaculture facilities