



# UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Agrarie, Alimentari e Forestali		
ACADEMIC YEAR	2023/2024		
MASTER'S DEGREE (MSC)	MEDITERRANEAN FOOD SCIENCE AND TECHNOLOGY		
INTEGRATED COURSE	ANIMAL FOOD AND FISHERIES - INTEGRATED COURSE		
CODE	20213		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	AGR/19, AGR/20		
HEAD PROFESSOR(S)	MESSINA CONCETTA MARIA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	MESSINA CONCETTA MARIA	Professore Ordinario	Univ. di PALERMO
	BONANNO ADRIANA	Professore Ordinario	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	1		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p><b>BONANNO ADRIANA</b></p> <p>Tuesday 09:00 13:00 Dipartimento Scienze Agrarie, Alimentari e Forestali, edificio 4 ingresso G stanza 70</p> <p>Wednesday 09:00 13:00 Dipartimento Scienze Agrarie, Alimentari e Forestali, edificio 4 ingresso G stanza 70</p> <p>Thursday 09:00 13:00 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 Vie 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.ssa ADRIANA BONANNO*

### 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

Students will learn the main systems for quality production and traceability of food products to acquire skills and abilities to identify and valorize guaranteed quality products. In particular, objective of this course is to impart knowledge about the general aspects related to the assessment of the quality of product of animal origins. The parameters that define the quality of food of animal origin (hygienic, chemical and physico-chemical, organoleptic and technological characteristics) will be described, explaining the main factors that can cause variations. The analytical methods and procedures for assessing the quality of animal products (milk and meat) will also be outlined.

## SYLLABUS

Hrs	Frontal teaching
1	General information; Introduction to the course.
2	The drinking milk: general aspects of quality.
2	Heat treatment parameters of milk . The homogenisation process of milk: advantages and disadvantages.
5	The quality of milk for direct consumption and dairy processing. Evaluation of main parameters that define the milk quality. Payment of milk according to quality. Influence of production systems on the quality of milk and dairy products.
1	The meat: chemical composition and general aspects related to the quality.
3	Muscle structure and biochemistry. Effects of slaughtering and post-mortem treatments on meat quality.
4	Evaluation systems of chemical, nutritional, organoleptic, technological and sensorial quality of the meat of livestock animals. Labeling of meat products according to current legislation.
1	Preservation technologies for fresh meat.
3	The traceability as tool for the quality of livestock products. Genetic traceability of livestock products. Application on dairy and meat products.
Hrs	Practice
8	Technical visits to livestock commercial farms. Milk coagulation properties. The use of lactodynamography: Laboratory activities. The use of MilkoScan for the analysis of milk quality.

## 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>	50554-Discipline della produzione e gestione.
<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	The role of fishery products in the 2030 Agenda for the sustainable development goal . The SDG14 and the blue growth principles in support of the fishery products in the food value chains
2	the one health strategy and its role in promote animale welfare and quality of the fishery production
3	Effect of climate change and human impact on the state and quality of fish resources, at global and local level
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 quality, enhancement of strategies for its promotion.
4	From traditional Mediterranean products (bottarga, anchovies, tuna) to smart packaging
3	general overview of Mediterranean resources. Analysis of the main categories of supply chains and products and the sustainability of their production systems
3	Integrated multitrophic aquaculture and combined fish-molluscs-algae production as a strategy for improving sustainability and producing value-added nutritional components.
3	the european green deal and the circular economy strategy in the fishery sector to gain sustainability and zero waste goal
2	New frontiers in seafood: seaweed, plankton
3	extraction of bioactive molecules for food, feed, nutraceutics and packaging: case studies (omega-3 enriched fish oil, astaxanthin and protein hydrolyzates, gelatin, polyphenols and carotenoids)
3	rapid and non destructive methods for quality of fish products in the industries: freshness meter, fatmeter, NIRS
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.
3	The role of nutritional parameters in the Description of the attributes that characterize resources, their origin and the production system: fatty acid profile and specific value chains (farmed, wild, species differentiation)
2	certificazion bodies and system for processes and products

<b>Hrs</b>	<b>Practice</b>
6	training on species on processing, packaging in laboratory or via web.
<b>Hrs</b>	<b>Others</b>
6	Visit to fish processing plants: bottarga, canned tuna, sardines, smoked products or, in alternative, seminar held by representatives of the productive sectors.
6	Visit aquaculture facilities or, in alternative, a seminar held by representatives of the productive sector