



Veterinary Continuous Education in Europe
International non-profit association

Competences for

VETCEE accredited

Bovine Health and Production programs

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Approved by

The VETCEE Board

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October 2015

‘Dossier of competences and module descriptors for VETCEE accredited “bovine health and production” programmes, drafted by the VetCEE subcommittee on “bovine health and production”

This draft on standard for middle-tier training programmes for veterinarians working in the field of bovine health and production was developed under the supervision of the European College of Bovine Health Management by a group of experts working in different roles (academia, private practice, industry) related to bovine health management and bovine production.

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This draft has been approved by the board of the ECBHM (date of approval: 20.07.2015)

VETCEE accredited programmes in Bovine Health and Production

This document provides the guidelines and the minimum standards that should be met by national veterinary postgraduate programmes, which are intended to promote structured continuing professional development in the field of “**bovine health and production**” accredited by VETCEE.

This document is in accordance with the “**Standards and dossier of competencies for accreditation of European veterinary post graduate continuous education programmes**” as approved by the VETCEE board in May 2014.

VETCEE accredited programmes in “bovine health and production” should be achievable by bovine practitioners in full time employment; the programmes should allow a graduate practitioner to improve her/his level of knowledge, skills and competencies in the field of “bovine health and production” and its supporting disciplines to a level higher than graduation level but a level below that of an European diplomate specialist.

VETCEE accredited programmes in “bovine health and production” should guarantee that the acquired qualification does meet the general requirement of the **European Qualification Framework (EQF) Level 7** under the three categories of **knowledge, skills and competencies**, as outlined in the Bergen conference of European ministers responsible for higher education 2005.

VETCEE accredited programmes in “bovine health and production” are in accordance with directive 2013/55/EU: “*Continuous professional development should cover technical, scientific, regulatory and ethical developments and motivate professionals to participate in lifelong learning relevant to their profession*”.

VETCEE accredited programmes in “bovine health and production” will instantly step into mutual recognition. ECTS-credits (European Credit Transfer and Accumulation System Credits) can be transferred also trans-nationally among VETCEE accredited programmes in “bovine health and production”.

General characteristics of the VETCEE accredited programmes in “bovine health and production”

VETCEE accredited programmes in “bovine health and production” should be structured on modules which all together provide **30 ECTS** (European Credit Transfer System) units of learning, one ECT corresponding to approximately **25 hours** of learning. In this way, programmes will typically consist of approximately **750 hours of blended learning**, which is equivalent to **6 months full-time learning**.

Programme planning should allow candidate to spread the learning over a period of **approximately 3-6 years** (equivalent to 2 months and 1 month full-time learning per year, respectively). Therefore programmes are encouraged to be organized so that modules are combined in order to allow students to acquire the necessary credits accordingly.

The curriculum covers all the important aspects related to:

- a) bovine health, both at the level of individual animal and herd health (including clinical sciences, nutrition and welfare),
- b) and bovine production (including food hygiene and public health).

The core curriculum provides 29 ECTS. An additional ECTS can be provided on a subject related to emerging topics in the field left to the provider’s discretion.

Teachings as well as assessments of the learning outcome can be undertaken in the native language.

Programmes are encouraged to use a **mixture of teaching methods** in order to address different learning styles. It is expected that direct classical lectures and practical session are accompanied by/accomplished with web-seminars, e-learning, self-direct learning sessions, tutorials, case studies, workshop, assignments, etc...

With respect to direct teaching, it will be up to the provider as to how this is provided, but it is expected that some of this will be face to face (classical teaching or seminars). A minimum attendance of 80% of practical sessions will be expected.

Wherever possible, the transfer of modules acquired in other VETCEE accredited programmes should be facilitated.

Programmes should include a system that allows for necessary career breaks for family, health or professional reasons.

Programmes should ideally be headed or at least jointly organized by EAEVE accredited or approved institutions. However, institutions/associations with an established reputation at national level are also allowed to apply to lead programmes.

The programmes should consider the presence of at least one Diplomate of the European College of Bovine Health Management in the programme team and at least one member with a qualification in Education or proven relevant teaching experience. In any case, the qualification and experience of all teachers involved in the delivery and/or assessment of the programme must be adequate to the programme.

Programme providers should have a policy and associate procedures for the **assurance of the quality and standards** of the programme design and delivery, assessment of candidates, quality of teachers and learning resources (texts videos, software and other materials used to assist participants), information system and communication. More details are depicted in the aforementioned “Standards and dossier of competencies for accreditation of European veterinary post graduate continuous education programmes” (chapter 8) approved by the VETCEE board.

Providers who want to be responsible for VETCEE accredited programmes should apply to the VETCEE board; application and supporting documentation must be in English. The VETCEE board may appoint an independent evaluation panel that assesses each applicant programme and makes recommendations to the applicant as well as to the board for final approval.

VETCEE accredited programmes must be re-evaluated at least every five years.

VETCEE programme eligibility

Candidates are eligible to apply for a VETCEE accredited programme in “bovine health and production” if they are qualified in veterinary medicine and have worked in an appropriate sector relevant to bovine health management and bovine production for a time equivalent to one year.

Candidates cannot carry out the programme in less than three and should complete the programme in a period up to six years.

Learning outcome assessment and final exam

Continuous assessment (possibly linked to each module) is strongly recommended in order to stimulate learning throughout the whole studying period and to prepare the candidates for the final exam.

In order to be eligible to sit for the final exam, candidate should:

- a) have acquired 30 ECT distributed according to VETCEE accredited programmes in “bovine health and production”;
- b) have passed the continuous assessment as provided by the programmes;
- c) have submitted at least two deliveries in written form that can be either :
 - a. a detailed case or research report;
 - b. a dissertation, review or integrative essay on a topic of own choice related to bovine health and production;
 - c. a publication in a scientific journal (international journal or journal of recognized reputation at national level) or a communication/poster at a congress (international congress or congress of recognized reputation at national level).

The organization, documentation and quality assurance of the different continuous assessments as well the final exam is the responsibility of the programme providers.

Re-certification of awarded veterinarians

VETCEE accredited programmes will be required to have a system in place for re-certification of awarded veterinarians at least every five years. The requirements for re-certification can be based on completion of a minimum of 20 hours of relevant CE per-annum averaged over five years (e.g. national or international congresses or conferences, or meetings or some other events organized by institutions or associations of recognized reputation at national or international level). Providers of VETCEE accredited programmes in “bovine health and production” can also organize recertification modules.

Modules of the VETCEE accredited programmes in “bovine health and production”

Table 1 and Annex 1 depict the modules of the VETCEE accredited programmes.

29 ECTS should be provided by subjects included in the core curriculum (tab. 1); one additional ECT should be provided by a subject related to emerging topics in the field left to the provider's discretion. Modules can be combined individually and can be taken at students' convenience.

It is suggested that about 40% of the time reserved to the modules is provided by direct teaching (classical lectures or webinars, and practical), the rest by using self-direct learning sessions, tutorials, case studies, workshops, assignments e-learning etc...

Given the social, economic and political differences among European countries in relation to agricultural and farming system, each provider may need to arrange the core curriculum accordingly to better meet specific local needs.

In order to prepare the candidates to the final exam it is strongly recommended to consider formative assignments.

Table 1

Overview of different modules (core and specific modules) that comprise the courses of standardised postgraduate training in “bovine health and production” as accredited by the VETCEE

Modules	ECTS
Professional skills	1
Practice management and communication	1
Cattle production, husbandry, marketing and animal health economics	2
Animal welfare and ethics (including EU related legislation)	1
Bovine nutrition (including nutritional physiology, dietary constituents, commonly used methods of forage conservation, commonly used feeding regime, dietary formulation)	3
Non infectious diseases (*) (including their cause, epidemiology, prevalence, pathogenesis, diagnosis, differential diagnoses, therapeutic regimes, control and prevention)	3,5
Infectious and parasitic diseases (*) (including their epidemiology, prevalence, diagnosis, control and prevention; notifiable diseases and related legislation; emerging arthropod borne diseases, biosecurity and control methods on cattle units and within the cattle industry)	3,5
Reproduction (including reproductive management, gynecology and obstetrics)	4
Udder health (including mastitis, milking machines and milk quality)	2
Foot health and lameness	1
Surgery and anesthesia	2
Diagnostic investigations (including clinical investigation, ancillary diagnostic methodologies and postmortem investigation)	3
Herd health planning and investigation	1
Food safety, consumer protection and environmental protection (including related EU legislation)	0,5
Drug usage and prescription (including EU related national and EU legislation)	0,5
Free for others	1
TOTAL ECTS	30
<i>(*) Provider may evaluate the opportunity of integrating these two modules and presenting diseases according to organ/system syndromes, age related syndromes, category related syndromes, problem based, and so on..</i>	

Annex 1

Description of the modules of the VETCEE accredited programmes in “bovine health and production”

Professional skills

(1 ECTS = 25 hours)

About this unit

This module is intended to equip candidates with general key skills that are required from an experienced bovine practitioner acting independently or in a leadership role, who may be in charge of the delivery of high quality first opinion veterinary care.

In this module candidates should be made aware of the importance of

- professionalism, attitudes, and behaviours that are consistent with their professional role of bovine practitioners
- highest moral and ethical standards, and motivation to serve and interact effectively with people of all ethnic, social, cultural, and religious backgrounds
- legal and ethical aspects in practising veterinary activities, and function within both the law and the ethical standards
- physical, cognitive, and emotional abilities that enable to tolerate physically and emotionally taxing workloads, to function effectively under stress, and to display flexibility and functionality in the face of uncertainties inherent to assessing problems
- life-long learning
- capability in obtaining, retrieving, analysing, integrating and synthesizing information from multiple sources (IT included) efficiently and accurately
- ability in processing multiple situations simultaneously as well as in formulating and testing hypotheses that enable effective and timely problem-solving in the diagnosis/treatment of patients and in the recognition of problems affecting the management and the efficiency of a farm
- high level of compassion for all animals and people
- excellent interpersonal and communication skills
- keeping record in an accurate and legible way
- ability in sourcing appropriate literature
- prudent behaviour during activities in order to avoid and/or be able to escape physically dangerous contacts with animal patients
- implementing compliance to national requirements for the safe handling and disposal of relevant hazardous and biomedical waste
- eco-friendly activity, sustainability of cattle production

Main topics

- Welfare, ethics and legislation
- Personal development: interpersonal abilities
- Flexibility/Adaptability/Managing Multiple Priorities
- Data analysis and records keeping

- Waste disposal
- Biosecurity rules
- Animal restraint
- Information technology and social media
- Literature research
- Critical thinking and creative thinking: curiosity and life-long learning

Professional practice management and communication

(1 ECTS = 25 hours)

About this unit

This module is intended to equip candidates with management skills both at the level of clinical cases or submitted problems within the first opinion practice and at the level of team work. Moreover, it is intended to equip candidates with communication skills in respect to specialist output to the owners and to integrating work within working groups.

In this module candidates should be made aware of the importance of possessing valuable knowledge and skills in:

- practice management and business
- personnel management and communication within working group
- fostering good team work, delegating task, constructively criticizing and praising
- understanding of the stakeholders
- presenting clinical cases, herd problems, professional concerns in the surrounding of a workshop, scientific meetings or bargaining meetings
- composition/writing of clinical or problem-related reports
- communication during collection of comprehensive clinical and problem-related history
- communication in reporting treatment plans, progress, results, findings as well as in suggesting solutions to the owners
- handling difficult situations such as outbreak of notifiable diseases, euthanasia, breakdown of a whole population, economic crisis, owners complaints
- handling farm workers/employees

Main topics

- Business management
- Case management
- Client management
- Team work
- Stakeholder analysis
- Applied communications
- Effective communication management
- Conflict management

- Time and resource management

Cattle production, husbandry, marketing and animal health economics

(2 ECTS = 50 hours)

About this unit

This module is intended to update candidates on herd management and organization. In this respect the course is expected to present the different kind of structure and organization of a dairy and beef farm. Particular focus should be devoted to the economic aspects of animal production.

In this module candidates should acquire/improve theoretical and practical skills in:

- dairy and beef farm infrastructures
- herd management: structure and organization of a herd
- grouping strategies
- use computer-based record keeping systems
- management of intensive production systems
- milking management and milking parlours
- benchmarking and performance evaluation
- health economics: disease cost and direct or indirect loss due to diseases
- analysis of criteria for evaluating adaptation of that technology and management.
- management of calf and replacement heifers
- economics of production (farm/business management)

Main topics

- Herd management
- Health economics
- Dairy and Beef cattle business management

Animal welfare and ethics

(including EU related legislation)

(1 ECTS = 25 hours)

About this unit

This module is intended to illustrate the animal welfare basic concepts, to update on current (both at national and EU level) development of legal framework in respect to farming, transportation and slaughtering, as well as to increase the awareness of the

importance of animal welfare in respect to the animal health, production and food safety. Moreover, it is intended to initiate the candidates to new assessment approaches of welfare, such as the animal-based measures (e.g. directly related to animal body condition, health aspects, injuries, behaviour etc), resources-based measures (i.e. characteristics of the housing system such as floor type, pen size, ventilation, etc.) and the management-based measures (handling, environmental, enrichment, etc). Furthermore, candidates will be equipped with management tools for planning reliable and effective strategies to ameliorate the level of animal welfare in the farm.

In this module particular emphasis should be addressed to allow candidates to acquire/improve theoretical and practical skills in:

- EU and national legislative framework on farm animal welfare
- commercial and economic impact of animal welfare
- animal welfare assessment schemes (animal-based measurement; resources-based measurement; management-based measurement)
- animal welfare improvement strategy plan
- awareness of acceptance of the recognised agricultural and animal husbandry practices by the consumers

Main topics

- Ethics and animal production
- Animal welfare indicators
- Animal welfare assessment
- Animal welfare improvement strategy plan
- Legislation on animal welfare

Bovine nutrition

(3 ECTS = 75 hours)

About this unit

This module is intended to update candidates on dairy and beef cattle nutrition, starting from composition and roles of feedstuffs, water quality and nutrient digestibility. The candidates will be updated on the most recent knowledge on feedstuffs analysis and about their production, storage and utilization. The course will present various feeding guides and the “dynamic nutrition” of the animals according to the latest research and balancing software.

In this module candidates should acquire/improve theoretical and practical skills in:

- nutritional physiology and behaviour
- nutrients: production and conservation of nutrients, types, sources, characteristics
- grazing and production based on grazing
- uni-feed technology

- nutrients evaluations
- animal requirements and factors affecting feed intake
- calf feeding and weaning strategies
- balancing diets for heifers, dry cows, transition cows, lactating cows, beef and feedlots cattle.
- nutrition and formulation computer software: working with them
- managing for healthy rumen function
- role of nutrition for milk & meat quality and animal health.
- heat stress and nutrition
- feedstuff storage and diet delivery
- feed contamination
- impact of animal feeding on environment
- nutritional management tools (body condition scoring, feed testing and sampling)
- nutritional economics (feed budgeting)

Main topics

- Basic digestive physiology and nutrient requirements
- Methods used to evaluate feeding, including selection of feeds and feed digestibility
- Formulation of suitable feed rations for different animal categories
- Nutrition management on the farm

Non infectious diseases

(3,5 ECTS = 87,5 hours)

About this unit

This module is intended to update candidates on the most recent knowledge on non-infectious diseases of cattle, both at the level of individual animal and at the level of the herd. In this respect the module is expected to illustrate non-infectious diseases' causes, epidemiological aspects, prevalence, pathogenesis, diagnostic possibilities, differential diagnoses, therapeutic approaches, control and prevention.

In this module particular emphasis should be placed on allowing candidates to acquire/improve theoretical and practical skills in:

- general pathological states: dehydration, toxemia, septicemia, pain and stress
- metabolic disorders and transition cow problems
- intoxications and deficiencies
- diseases of the forestomachs
- diseases of the abomasum
- enteric diseases
- colic syndrome
- respiratory diseases
- cardiovascular diseases
- muscular diseases

- urinary tract disorders
- skin and ocular diseases
- neurologic diseases
- navel diseases
- inherited diseases
- congenital malformations

Main topics

- Metabolic diseases
- Bovine internal medicine
- Diseases of body systems
- Inherited and congenital diseases

Infectious and parasitic diseases (transmissible diseases)

(3.5 ECTS = 87,5 hours)

About this unit

This module is intended to update candidates on the most recent knowledge on infectious and parasitic diseases of cattle, both at the level of single animal and at the level of the herd with a focus on the situation in Europe and bordering countries. In this respect the module is expected to illustrate infectious and parasitic diseases' causes, epidemiological aspects, prevalence, pathogenesis, clinical signs and lesions, diagnostic possibilities including differential diagnoses and control/eradication measures including vaccination and treatment. Special attention should be given to zoonoses, notifiable diseases in cattle and appropriate EU legislation. Biosecurity and bio-containment including disinfection and disinfectants use should also be considered.

In this module particular emphasis should be placed on allowing candidates to acquire/improve theoretical and practical skills in:

- main transmissible diseases causing morbidity and mortality in calves, feedlot cattle, heifers, cows and bulls
- cattle zoonoses
- cattle notifiable diseases and their legislation
- main exotic cattle diseases in countries bordering to Europe
- transmission of cattle diseases through gametes and embryos
- immunity and vaccination programmes
- biosecurity risk associated with the farm (e.g. buying in of stock)
- bio-containment risk associated with the farm (e.g. risk of spread within the holding)
- surveillance, control and eradication measures and programmes

Main topics

- Transmissible diseases in cattle

- Cattle zoonoses
- Cattle notifiable diseases in Europe and cattle exotic diseases in bordering countries
- Biosecurity and bio-containment
- Surveillance, control and eradication programmes

Reproduction

(including reproductive management, gynaecology and obstetrics)

(4 ECTS = 100 hours)

About this unit

This module is intended to update candidates on the pathophysiology of the bovine reproduction as well as on the most recent knowledge in term of investigation and management of reproductive problems, both at the individual level and at the herd level.

In this module candidates should acquire/improve theoretical and practical skills in:

- anatomy and physiology, development and maturation of the reproductive tract (puberty); male and female
- heat detection, timing of insemination and artificial insemination technique
- oestrous synchronization, controlled breeding and timed insemination
- reproductive management of dairy and beef herds: decisions based on evidences of the herd (reproduction index, data recording). With and without natural breeding diagnostic in reproduction: tools and technology: rectal palpation, ultrasonography, other ancillary methods (citobrush, hormone determinations...)
- goals for reproductive management and evaluation of reproductive herd performance
- factors affecting conception and reproductive performances
- infectious diseases causing infertility problems in cattle (including embryonic death and abortion)
- effects of feed quality and mineral imbalances on reproduction
- exploration of the bull: management, selection and care of the sire
- economic analysis of reproduction
- handling of frozen semen
- dairy genetics and genomic
- obstetrics: assistance to parturition, dystocia, complication and emergencies
- evaluation of the puerperium and resumption of cyclical activity
- reproductive biotechnologies: embryo transfer, cryopreservation of embryos, in vitro production, ovum pick up
- health issues related to reproductive biotechnologies: legal and management issues

Main topics

- Pathophysiology of the reproduction
- Management of insemination and natural mating
- Systematic breeding programs and management of the reproduction

- Reproductive diagnostic methods and tools
- Reproductive disorders
- Obstetrics
- Dairy genetics and genomics
- Male fertility and care
- Reproductive biotechnology

Udder health

(including mastitis, milking machines and milk quality)

(2 ECTS = 50 hours)

About this unit

This module is intended to give evidence of the economic repercussion of udder diseases in terms of reduced production, increased replacement costs, discarded milk, drug costs, veterinary fees, and labour costs. In this module candidates should improve their ability on how to manage udder health, preventing, controlling and treating udder disorders, including subclinical or clinical mastitis. Moreover, the module should increase the awareness of the importance of udder health management in respect to (veterinary) public health especially regarding the risk of antibiotic residues and antibiotic resistance, as well as food safety and food quality.

In particular, candidates should improve their theoretical and practical skills in:

- prevention of udder diseases through optimisation of nutrition, host resistance, environmental conditions, milking equipment, milking technique, and hygiene
- mastitis diagnostic: standardized severity clinical scores, screening tools and other on-farm ancillary diagnostic methodologies, submission of milk samples to an external laboratory
- interpretation of milk culturing for the identification of mastitis pathogens and for the decision process about treatment, culling, segregation and disease control programs
- somatic cell counts (included dynamics across the different lactation phases)
- characteristics of mastitis pathogens
- treatment of clinical mastitis caused by specific pathogens (selection of antibiotics)
- evidence-based use of intramammary or systemic treatments, treatment of subclinical infections in the post-partum period, blanket dry-cow therapy vs. selective dry-cow therapy
- evaluation of the effectiveness of mastitis vaccines
- premilking preparation and milking routine
- milk quality and benchmarks
- antibiotic drug residue and antibiotic resistance
- milking machines: knowledge and relationship with teat condition and udder health
- immunology of mastitis

Main topics

- Anatomy and function of the bovine udder
- Milking procedure and milking machine
- Mastitis and udder health
- Prevention, therapeutic approach and control of udder problems

Foot health and lameness

(1 ECTS = 25 hours)

About this unit

This module is intended to update candidates on the prevention and control of foot problems, both at individual level and at herd level.

In this module candidates should acquire/improve theoretical and practical skills in:

- recognition and diagnosis of foot problems
- clinical and subclinical lameness
- hoof trimming and hoof-care treatments
- use of locomotion/lameness scoring and of the locomotion charts
- nutrition as a risk for foot problems
- stall design, flooring and other risk factors for lameness

Main topics

- Anatomy and function of the bovine hoof
- Foot pathology
- Prevention and control of foot problems

Surgery and anaesthesia

(2 ECTS = 50 hours)

About this unit

This module is intended to promote the basic competence, skills and experience in the most important and common surgical procedures practicable in a bovine practice and to provide bovine practitioners with practical elements of pain management.

In this module candidates should acquire/improve theoretical and practical skills in:

- the basic principles of veterinary surgery, including asepsis and antisepsis, first and secondary tissue healing processes, surgical instruments and their appropriate use, suture materials, knotting techniques and suture patterns, wound management and use of drains

- patient management in the perioperative period
- pre-operative clinical assessment, evaluation of suitability of a patient for sedation and/or anaesthesia, patient preparation for surgery
- the most common surgical procedures in young and adult cattle, particularly those related to abdominal problems (e.g.: hollow viscera displacement or ileus), umbilical structures and urogenital structures (e.g.: caesarean section, retention suturing for vaginal or cervical prolapse; urethrostomy), basic ocular surgical emergencies as well as upper respiratory tract, claw and teat surgeries
- pain management at disbudding, dehorning, nasal ring application, tail docking and castration procedures
- basic pharmacology of the drugs commonly used for sedation, premedication, general and local anaesthesia, used in critical patients emergency, anaesthesia and recovery (cardiovascular, haemostasis, fluids, electrolytes, acid base status)
- principles of anaesthetic technique (local, regional and general)

Main topics

- Calf surgery
- Bovine surgery
- Anaesthesiology

Diagnostic investigations

(3 ECTS = 75 hours)

About this unit

This module is intended to improve participants' skills in clinical investigation and to provide them with hands-on experience in advanced diagnostic procedures (e.g.: ultrasound and endoscopy) and in clinical ancillary diagnostic methods available to bovine practitioners. Particular attention will be devoted to point-of-care testing. Moreover, candidates should receive basic information on how to interpret histopathological findings of submitted biopsy/cytology samples and on how to formulate appropriate morphologic diagnoses. The module will also include post mortem examination.

In this module candidates should acquire/improve theoretical and practical skills in:

- clinical investigation, as an indispensable competence for making a reliable tentative clinical diagnosis
- ultrasound, as a routine diagnostic procedures in gynaecology and pregnancy diagnosis (see reproduction) as well as in other clinical indications (e.g. ultrasonography of the abdomen, of the umbilical structures in calves, of the urinary tract, of the teat, of the heart, ...)
- endoscopy, as advanced techniques for diagnostic (e.g. laparoscopy, rhino-laryngo-tracheal-bronchoscopy, cystoscopy, theloscopy, taking biopsies) and therapeutic purposes (e.g. abomasal displacement)

- clinical pathology (haematology, blood gas analysis, cytology, clinical chemistry and urinalysis)
- microbiology (bacteriology, virology with immunology, and mycology) and parasitology
- toxicology and histopathology
- best practice sampling (including biopsy of different tissues), specimen handling and processing, submission of specimens to laboratories
- interpretation of the results and their role in the final diagnosis
- systematic approach to post-mortem examination

Main topics

- Clinical investigation
- Imaging diagnostic
- Laboratory veterinary medicine
- Post-mortem investigation

Herd health planning and investigation

(1 ECTS = 25 hours)

About this unit

This module is intended to update candidates on the most recent knowledge on herd health and production programmes for the purpose of improving cattle health and production, public health and food safety, and animal welfare.

In this module particular emphasis should be given to allowing candidates to acquire/improve theoretical and practical skills in developing a herd health program that includes all management plans, procedures and investigations methods to be used to produce healthy cattle and prevent their diseases. The course should also increase the awareness that nutrition, vaccination, management, and housing programs should be properly managed to keep disease resistance high at all times.

The following issues should be particularly kept in mind:

- concept of prevention rather than treatment
- impact of diseases on reproduction, growth and performance and finally on profitability of cattle operations
- costs and returns of cattle farms
- impact of veterinary treatment on profitability of operations
- herd health calendar
- computer-based tools to optimize farm performance
- main parameters and objectives according to cattle genetic potential
- data collection systems (sometimes called monitoring)
- data analysis and applied statistical methods in population studies.
- identification of key health/production constraints

- reports to farmers and others subsequent actions
- planning of prophylactic strategies (e.g., vaccination, deworming, vitamin supplementations)
- principles of epidemiology and population health

Main topics

- Herd data collection
- Herd data analysis
- Herd reports
- Herd programmes

Food safety, consumer protection and environmental protection

(including related EU legislation)

(0,5 ECTS = 12,5 hours)

About this unit

This module is intended to equip candidates with knowledge of the influence of farming practices on safety of food producing animals; the candidates must be able to manage risks for consumers related to biological and chemical hazards, their sources of contamination of animal foods and strategies to control them at farm level. Candidates will receive basic information on how to recognise, establish and describe the components of the supply chain that connect producers to consumers. Moreover the module is intended to equip the candidates with communication skills to the owners and to stakeholders within the food production chain.

Particular emphasis should be devoted to:

- on-farm food safety measures
- meat inspection data, slaughter checks and associated local and EU legislation
- dairy inspection data and associated local and EU legislation
- EU's Rapid Alert System for Food and Feed (RASFF) and European Food and Safety Agency (EFSA)

Main topics

- Pre-harvest food safety measures
- Risk assessment, risk management and risk communication in cattle-derived products
- EU legislation in cattle-derived products
- Quality assurance schemes

Drug usage and prescription

(including EU related national and EU legislation)

(0,5 ECTS = 12,5 hours)

About this unit

This module is intended to update candidates on current law concerning the legal use of drugs for the treatment and prevention of diseases in cattle as well as the legal use of biocides.

Particular emphasis should be devoted to:

- responsible use of medicines, especially prudent use of antibiotics
- process flow of license of drugs within EU
- calculation of MRL
- withdrawal period
- pharmacovigilance
- rededication of drugs for the use in cattle
- specific EU and national legislation related to prescription, dispensing and using veterinary drugs and medicated feed
- legislation and use of biocides
- use of the exceptional prescription in the bovine clinical practice
- civil liability and criminal sanctions for the drug-prescriber due to non-compliance with regulations
- legislation and commitment to pharmacovigilance systems and control programs aiming to reduce and prevent antibiotic resistance
 - microbial sensitivity test interpretation and development of protocols and antibiotic use strategies to increase antibiotics' efficiency and to reduce the risk of the emergence of resistance.
- general pharmacokinetics and pharmacodynamics knowledge
- education regarding the relevance of a proper dosing and the interactions of the different drugs when used orally: with the milk, drinking water or feed

Main topics

- EU related national and EU legislation
- Cascade of rededication
- Pharmacovigilance, on-farm food safety measures

Free for others

(1 ECTS = 25 hours)

About this unit

The subject, objectives and topics of this module are left to the provider's discretion.