

Appendix 15. Research areas in DVM.

Anatomy of Pets

The Field of Anatomy of Domestic Animals (VET-01) has been carrying out researches on different topics that characterize the scientific production of the disciplinary group. A research line focuses on morphological, quali-quantitative studies of the microtubular cytoskeleton on continuous neural cells (schwannoma, glioblastoma and neuroblastoma lines) and primary (sheep, dog) and germ cells (oocytes). Other topics, always related to neuroscience, are represented by studies on the expression and localization of aromatase in the sheep hypothalamus and studies on cellular senescence and oxidative stress on neural cells. Another research line is represented by anatomical-comparative surveys on the bone macro and micro-structure in different domestic (femur and tibia in equine / bovine, sheep / goat, pig / wild boar) and wild animals (griffon vulture / flamingo). A third line is represented by paleoanatomical studies conducted on faunal remains of the Nuragic, Punic-Roman and early Medieval ages coming from archaeological excavation areas in Sardinia and in the Mediterranean area.

Physiology of Domestic Animals

The research activity concerns different aspects related to: study of reproductive activity in both sexes of animal species of veterinary interest; application of reproductive technologies in vivo and in vitro aimed at the knowledge of the basic mechanisms of reproductive biology; development of systems for the cryopreservation of gametes and embryos aimed at the establishment of biobanks; genetic evaluation and conservation of animal biodiversity.

Endocrinology, General Animal Husbandry and Animal Welfare

The research activity concerns different aspects related to: methods for improving reproductive efficiency in small ruminants. Use of melatonin as a nutraceutical molecule and its effects on the animal organism. Study of new physiological indicators of stress in farmed ruminants. Effects of different foods on the gut microbiome in ruminants. Study of genes involved in the control of reproductive seasonality in ruminants. Investigation of genes responsible for reproductive efficiency in sheep. Expressions of certain genes involved in the regulation of lipid production in milk

Special Zootechnics

The research activity in the SSD AGR / 19 concerns different aspects related to the breeding of the main animal species in production, such as sheep, goats, cattle, pigs and horses. The study of livestock systems makes particular reference to the assessment of the hygienic-sanitary conditions of the farms and to the respect for the environment and animal welfare, essential conditions for obtaining healthy and high-quality food. Several studies have been focused on the characterization and evaluation of milk and meat production, correlating them to the different production phases, breeding techniques and animal genetics. In the latter field, modern technologies of biomolecular analysis and biostatistics are applied. The research unit has close collaborations with several national and foreign research groups.

Parasitology and Parasitic Diseases

The research activity explores the different aspects of parasitosis of farm animals and pets. In particular, it focuses on parasitosis of ruminants with particular regard to morphobiology, epidemiology diagnosis, control of parasitic diseases of sheep and goats, (Eimeriosis,

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Toxoplasmosis, Cryptosporidiosis, Cystic Echinococcosis, Cenurosis, Fasciolosis, Dicrocoeliosis, Gastro-intestinal and broncho-pulmonary nematodoses). The group, responsible for a parasitological diagnostic service for the Veterinary Teaching Hospital, carries out research in the field of parasitosis of pets with particular attention to: Leishmaniasis, Filariasis and Broncho-Pulmonary Nematodosi. Another line of research concerns the study of parasitofauna and the ecology of wild and farmed fish species, the pharmacological control of their parasitosis as well as the study of parasitosis of marine mammals.

Pharmacology and Toxicology

The research activity concerns different aspects related to: pharmacokinetic and pharmacodynamic evaluation of substances with pain-relieving activity on different animal species; study of the antioxidant activity of substances of natural origin on damage induced by heavy metals; pharmacokinetic study of new designer drugs; study of algal contaminations in bivalve molluscs in Sardinian waters; detection of drug residues as environmental contaminants in food of animal origin; development and validation of analytical methods for the research of xenobiotics in different matrices

Physiology of nutrition

The research activity concerns different aspects related to: study of the use of the natural essential oil of vetiver with advanced technologies to improve productive and reproductive performance in rams, through the evaluation of sperm parameters, hormonal profile and sexual behavior; study of the integration of the ration of adult barbarian rams with mugwort and rosemary and evaluation of seminal plasma and testicular parameters, sexual behavior and endocrine-metabolic profile, to the effects of reproductive performance.

Zooculture

The research activity is focused purely on the reproduction and feeding of avi-tunnels in order to achieve a zootechnical improvement of the breeding systems and therefore of the production performances, both from a quantitative and qualitative point of view. At the same time, alternative systems of management of the reproductive phase are being studied regarding the physiology and welfare of farmed animals.

Infectious diseases of pets

The research activity concerns different aspects related to: development of diagnostic systems and innovative vaccines for the control of infectious diseases; genomic and antigenic characterization of microorganisms causing agents of diseases with high economic impact in Sardinia; study of the mechanisms of the innate and adaptive immune response of animals; identification and study of bacterial and viral pathogenicity factors; identification and mechanisms of in vivo and in vitro transformation of viruses associated with tumor processes; identification, molecular diagnosis and phylogeny of pathogens transmitted by arthropods; epidemiological analysis on the distribution and spread of infectious agents, molecular epidemiology, identification and evaluation of risk factors and predictive epidemiology.

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Veterinary Surgical Clinic

The most important research interests concerns different aspects related to the use of new therapies in the treatment of diseases of the animal skeletal system (stem cells, growth factors, reparative and new therapies in diseases of articular cartilage), immune and inflammatory response of donkeys, diagnostic imaging (RM, ultrasound and elastosonography) and the animal model in surgery.

Veterinary Pathological Anatomy

The research activity concerns different aspects related to: highlighting of virus-ovine papilloma in preneoplastic and neoplastic skin lesions. Pathogenesis and immunopathology in infection with *Mycobacterium tuberculosis* and *M. bovis*; evaluation of damage repair on cartilage lesions implanted with embryonic and mesenchymal stem cells; study of bronchioloalveolar carcinoma in various animal species and in humans; the diagnosis, pathogenesis and prophylaxis of some clinical and subclinical mastitis of sheep and goats in traditional and organic farms; *Mycobacterium avium* subsp. paratuberculosis: evaluation of the ongoing pathogenic role of paratuberculosis and Crohn's disease; breast neoplasms of pets and prognostic and diagnostic studies also with reference to comparative oncology; pathologies with infectious and parasitic etiology in fishes and molluscs; pathological aspects of liver, breast and adipose tissue in lactating sheep and goats with different diets.

Veterinary Medical Clinic

The research activity concerns different aspects related to: clinical, epidemiological and diagnostic aspects in vector-borne diseases in domestic mammals; coagulation and transfusion medicine in dogs and cats; ultrasound in the study of the cardiovascular system in pets and horses; ultrasound in the diagnosis and monitoring of parasitic diseases; application of elastosonography in the evaluation of soft tissues of dogs, cats and horses; Herd/flock Health Management Programs, integrated programs for the health management and animal welfare of cattle and sheep and goat farms; use and validation of new on-site tests for the diagnosis of the main diseases of ruminants; metabolic alterations in cattle and sheep and goats during the transition period; treatment of left abomasal dislocation by minimally invasive laparoscopic technique and main outcomes; assessment of the oxidative status of cattle and sheep and goats; oxidative stress in cancer patients; well-being and preparation of dog co-therapists and assistance for the disabled; human-animal relationship and behavioral problems of a pathological or adaptive nature; correlation between nutrition, clinical and behavioral symptoms; studies on autochthonous breeds: Fonnese shepherd and Sardinian greyhound.

Obstetric and Gynecological Veterinary Clinic

The research activity concerns different aspects related to: development and application of assisted reproduction techniques in animals of zootechnical interest and in pets; artificial insemination and embryo transfer; techniques of conservation of seminal material in species of veterinary interest; development of innovative systems for germplasm cryopreservation; identification of molecular biochemical factors related to the competence of the oocyte and the embryo; development of new antioxidant strategies in germplasm manipulation and storage; creation of 3D culture systems in reproductive and stem cells; nanomaterials and reproduction; environmental contaminants and reproduction; physio-pathology of reproduction in the various species; markers of bovine fertility; factors affecting the development of gonads in sheep and cattle.

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Animal Production - Animal Nutrition and Nutrition

The research activity concerns different aspects related to: nutrition and feeding of domestic and wild animals; evaluation and use of feeding stuffs; use of insect meal in animal feed; microbiota of the digestive tract in relation to feeding domestic and wild animals; evaluation and use of innovative and sustainable foods and diets in domestic and wild animals; nutrition and quality of products of animal origin; feeding and metabolic profile of domestic and wild animals; feeding, performance and quality characteristics of the production of small ruminants, birds and farmed fish species; influence of some metals on the performance and metabolism of fish species; food safety for animals in livestock production; enhancement and protection of animals of local ethnic groups; traceability of the supply chains of Animal Production; environmental sustainability of animal nutrition; nutritional balance in the sport horse; food imbalances in pets; diet composition of wild animals.

O.A. Food Inspection

The research activity concerns different aspects related to: study of environmental contamination by pathogenic microorganisms in food production plants of animal origin; contamination by aflatoxin M1 in milk and sheep cheeses; molecular characterization of pathogenicity factors, antibiotic resistance and traceability of microorganisms isolated from food of animal origin; technological innovation for the optimization of the shelf-life of processed food products of animal origin; Microbial Challenge Testing in milk and milk and meat products; use of bioprotective cultures to minimize the risk of exposure to microorganisms that are agents of food-borne disease; study of the profile of biogenic amines in dairy and delicatessen products; prevalence, characterization and study of the antibiotic resistance profile in enteric pathogens isolated in fresh and processed meat; study of altering and pathogenic microorganisms in fish products; determination of bacterial, viral, bio-toxicological and chemical contaminants in bivalve molluscs; determination of histamine content in fish products

Zoology

The research activity concerns different aspects related to: ecology, behaviour, genetics, conservation and management of large mammals; monitoring of wildlife species that can be vectors of pathogens or impact human activities; study of the systematics, phylogeny, and biogeography of the Proseriates (Platyhelminthes), through an integrated approach; phylogeography, phylogeny and molecular taxonomy of marine invertebrates and fishes of conservation concern; population genetics and phylogeography of higher vertebrates of conservation and management interest; studies of reproductive biology, addressed with cytological and genetic techniques.