ENDOCRINOLOGY, PHYSIOLOGY OF REPRODUCTION AND ETHOLOGY OF DOMESTIC ANIMALS

(5 Credits; 55 hours: 48 frontal lessons and 7 practical activities)

At the end of the course the student should know in details the fundamental mechanisms regulating reproductive and metabolic activity of domestic animals. He/she should possess knowledge of the ethogram of the main species of veterinary interest.

Lessons

General issues	Topics	Specific contents	Hours
1. SEXUAL ENDOCRINOLOGY (21 HOURS)	***Introduction***	Hormone chemistry, transport, receptors and mechanisms of action. Regulation of hormone secretion and activity. Pituitary and hypothalamic hormones. Methods of hormone assay.	3
	Puberty	Physiology of puberty: factors affecting the time of puberty. Regulation of ovarian hormones secretion.	2
	Regulation of ovarian activity: the estrous cycle	Estrous cycle: general aspects and species-specific characteristics. Hormonal control of the estrous cycle. Follicular wave. Estrous behaviour.	2
		Ovulation. Regulation of prostaglandin synthesis. Mechanisms of luteal regression: peculiarities of species.	2
		Dog and cat estrous cycle.	1
	The male	Male reproductive system. Hormonal regulation of the reproductive function.	2
	Gametogenesis and fertilization	Oogenesis and spermatogenesis. Transport of spermatozoa in the female genital tract.	2
		Capacitation, fertilization and embryo development.	2
	Pregnancy	Pregnancy recognition and maintenance of corpus luteum. Hormone production during pregnancy.	1
	Parturition and postpartum	The diagnosis of pregnancy. The endocrinology of parturition. Initiation of reproductive activity after parturition (lactational anestrus, postpartum anestrus).	2
	Physiology of lactation	Mammogenesis, lactogenesis, galactopoiesis and mammary involution. The milk ejection reflex. Synthesis of milk components.	2

2. ENDOCRINE REGULATION OF GROWTH AND METABOLISM (9 HOURS)	***Metabolic hormones***	The thyroid gland: biosynthesis, secretion, transport and metabolism of thyroid hormones. Physiological and metabolic action of thyroid hormones. Hypo- and hyperthyroidism effects.	2
		The endocrine pancreas. Insulin and glucagon: structure, synthesis, secretion and metabolism. Major effects of pancreatic hormones. Consequences of insulin deficiency.	2
		Growth hormone: structure, synthesis, secretion and metabolism. Physiological and metabolic actions of GH. Disturbances in GH production.	1
		Physiology of bone. Regulation of calcium and phosphate homeostasis: PTH, vitamin D and calcitonin.	2
		The adrenal glands. Glucocorticoids: structure, synthesis and secretion. Physiological effects of glucocorticoids. Reduced or overproduction of glucocorticoids.	2

3. ETHOLOGY (18 HOURS)	***Introduction***	History and approaches to animal behaviour. The critical periods of the development: species peculiarity.	2
	Animal Learning	Associative and non-associative learning. Reinforcement and punishment.	2
	Animal Communication	Visual, tactile, auditory and chemical communication. Species peculiarity.	3
	Animal Behaviour	Feeding behaviour.	1
		Sexual behaviour in domestic animals.	2
		Maternal behaviour.	2
		Social behaviour and organization.	2
		Aggressive behaviour.	2
	Stress and welfare	Stress in animals. Animal welfare indicators. Stereotypies as welfare indicators.	2

Practical activities			
General issues	**Topics**	**Specific contents**	**Hours**
5. GAMETES EVALUATION AND ABILITY TO CARRY OUT A HORMONE ASSAY (7 HOURS)	***Female gametes***	Practical activities on the female genital tract in livestock species. Classification of ovaries depending on the stage of the estrous cycle: species differences. Isolation and evaluation of oocytes.	2
	Male gametes	Sperm collection and evaluation.	2
		Heat detection in livestock species and sexual behaviour. Maternal behaviour. (Videos)	1
	Hormone assay	Progesterone assay with ELISA method. Part I: preparation and sample loading. Part II: reading and interpretation of results.	2