OBSTETRICS, REPRODUCTION, UDDER HEALTH

QUESTIONS OF THE FINAL EXAM

(Theoretical part)

I.

Reproductive physiology, pharmacology and general pathology. Small ruminant reproduction.

1. The physiology of secretion of GnRH and pituitary gonadotropins.
2. Principles of therapeutic administration of GnRH in various species.
3. Principles of therapeutic administration of pituitary and extrapituitary gonadotropins in different species.
4. The stages of follicular development and maturation. The structure and hormone production of dominant follicles. The oocyte.
5. Formation, histology and endocrine function of corpus luteum.
6. The transport, physiological role and metabolism of progesterone and oestrogens. Pheromones in the animal reproduction.
7. Principles of therapeutic administration of estrogens and androgens in female domestic animals.
8. Principles of therapeutic administration of progesterone and synthetic gestagens in female domestic animals.
9. Species-based differences in the physiology of preovulatory LH peak and ovulation (species with induced and spontaneous ovulation).
10. Luteolysis. The secretion and physiological role of prostaglandin F2α.
11. Principles of therapeutic administration of prostaglandin F2α and its analogues in various species.
12. The fertilisation. The tubal and early intrauterine development of the embryo.
13. Vascularisation and circulation in the embryo and fetus. The nidation.
14. Anatomical and histological classification of different types of placentas. Development and anatomy of fetal membranes and their clinical relevance in domestic mammals.
15. Neuroendocrine regulation of the initiation of parturition. Mechanism of dilatation of the birth canal.

16. Signs of the approaching parturition (ruminants and pig). Stages, course and process of parturition (ruminants and pig). Disturbed labor activities in ruminants and pig.
17. Disturbances during the foetal stage of pregnancy (mummification, maceration, abortion, early parturition, postponed labour, stillbirth).
18. Developmental abnormalities as causing factors for dystocia. Monstrosities.
19. The main causes of perinatal mortality in various species.
20. Reproductive consequences of inflammatory diseases with intensive endotoxin / cytokine release in farm mammals.
21. The cyclic ovarian function and the seasonal pattern of reproduction in small ruminants.
22. Induction of ovarian cyclicty out of, and at the beginning of breeding season in small ruminants. Factors influencing the efficacy of these procedures.
23. Factors and treatment procedures influencing the ovulation rate in small ruminants.
24. Maternal recognition of pregnancy in small ruminants and the endocrinology of ovine and caprine pregnancy.
25. Diagnosis of pregnancy in small ruminants.
26. Infectious and non-infectious causes of abortion in small ruminants.
27. Pregnancy toxaemia (ketosis) in ewes. Resumption of cyclic ovarian function in postpartum small ruminants.
28. Diagnosis and treatment of genital disorders in sheep and goat.
29. Reproductive management in small ruminants.
30. Artificial insemination in small ruminants (estrus detection, technical procedures and determination of optimal time of AI). Principles of natural mating in sheep.

II.

Bovine reproduction

1. The cyclic ovarian function in the cow.
2. The wave-like pattern in development of gonadotrop-sensitive follicles in the cow.
3. Puberty of cattle. Breeding age and nutrition of heifers during the rearing period.
4. The importance of minerals, microelements, ß-carotene and vitamin-A in the bovine reproduction.
5. Reproductive aspects of certain modern feeding technologies in the dairy cow (inert fat and by-pass protein feeding; antiketogenic substances; consequences of bSTH treatment)
6. Effects of certain toxic feed constituents (toxic trace elements, eco- and mycoestrogens, other Fusarium toxins) and protein overfeeding on reproduction in cattle.
7. Endocrine treatments influencing the ovarian function in cows (induction of cyclic ovarian function; ovulation induction; oestrus synchronisation).
8. Incorrect timing of artificial insemination and/or delayed ovulation, as possible causes of infertility in cows (physiology, pathology, diagnostic aspects and clinical relevance). The "repeat breeding syndrome" of cows.
9. Maternal recognition of pregnancy in the cow and the endocrinology of bovine pregnancy. Termination of unwanted pregnancy and induction of parturition in the cow.
10. Diagnosis of pregnancy in the cow.
11. Occurrence and clinical relevance of embryonal / early foetal mortality in cattle.
12. Infectious and non-infectious causes of abortion in cows.
13. Diagnosis and treatment of neonatal asphyxia in calves.
14. Causes, occurrence, clinical relevance and management of retained foetal membranes in cows.
15. Metabolic and endocrine changes in dairy cows during the periparturient period and at the beginning of lactation (energy balance, fat soluble vitamins, minerals).
16. Physiology of involution in dairy and beef cows.
17. Bacterial complications of the uterine involution in cows (microbiological background).

18. Key points of the antibiotic and non-antibiotic (especially the prostaglandin) treatment of metritis and endometritis in cows.
19. Puerperal metritis and it's differential diagnosis in the cow.
20. Pathological background, diagnosis and treatment of endometritis (clinical, subclinical) and pyometra in the cow.
21. Parturient paresis (milk fever) of cows. Diagnosis and differentiation of the various paralytic conditions in periparturient cows.
22. Fatty liver disease and ketosis in dairy cows. Genital consequences of subclinical hyperketonaemia.
23. Comparative physiology of resumption of cyclic ovarian function in postpartum dairy and beef cows.
24. Pathology, diagnostic approach and management of long-lasting postpartum anoestrus in high-producing dairy cows.
25. Pathology and management of long-lasting postpartum acyclicity / anoestrus in suckling beef cows.
26. The cystic degeneration of the dominant follicle (formation of anovulatory cysts) in cattle.
27. Luteal dysfunctions in cows (corpus luteum persistency; shortening of the luteal phase; luteal insufficiency of nutritional and metabolic origin during the peak lactation)
28. Management of reproduction in beef herds.
29. Management of reproduction in high-producing dairy herds.
30. Artificial insemination in the cow (estrus detection, technical procedures and determination of optimal time of AI).

III.

Horse and swine reproduction

1. The cyclic ovarian function and the seasonal pattern of reproduction in mare.
2. The cyclic ovarian function in gilts and sows. The problem of the so-called “summer infertility”.
3. Puberty of gilts. Breeding age and nutrition of rearing gilts.
4. Factors influencing the ovulation rate in gilts and sows. Causes of the “partial infertility” (decrease in litter size) in swine.
5. Irregularities in estrus and ovarian cyclicity of mares (frequently occurring estrous symptoms in the spring transitional period, nymphomania, long-lasting anoestrus in the breading season): causes, diagnosis, therapy.
6. Endocrine treatments influencing the ovarian function in mares (induction of cyclic ovarian function; ovulation induction; oestrus synchronisation).
7. Endocrine treatments influencing the ovarian function in the swine reproduction (induction of cyclic ovarian function in gilts and post-weaning sows; oestrus synchronisation).
8. Maternal recognition of pregnancy in pigs and horses.
9. Endocrinology of porcine and equine pregnancy.
10. Diagnosis of pregnancy in mares.
11. Diagnosis of pregnancy in sows.
12. The course, clinical relevance and management of twin pregnancy in mares. Termination of unwanted pregnancy in mare.
13. Induction of porcine parturition; the so-called programmed delivery in the pig practice.
14. Characteristics of embryonic and foetal development in horses and pigs. Occurrence and clinical relevance of embryonal / early foetal mortality in mares and sows.
15. Infectious and non-infectious causes of abortion in mare and sow.
16. Gestational abnormalities in the mare (body pregnancy, premature placental separation, uterine torsion, umbilical cord torsion).
17. Predicting the time of the parturition in the mare. The foaling.
18. Postpartum period and postparturient abnormalities in the mare.
19. Clinical and pathological aspects of the postpartum uterine involution in sows. Other forms of porcine endometritis. Peripaturient hypogalactia syndrome.

20. Care of neonatal piglets. Splayleg and splayweak piglets. Urinary tract infections (UTI) in swine.
21. The comparative physiology of resumption of cyclic ovarian function in postpartum/postweaning mares and sows. The problem of the postweaning anoestrus in the sow.
22. The various forms of endometritis in the mare. Endometrosis (periglandular fibrosis) in the mare.
23. Effects of certain toxic feed constituents (mycoestrogens, other Fusarium toxins) on reproduction in pig. The cystic degeneration of ovarian follicles in sows.
24. Management of reproduction in stud farms.
25. Reproductive management in pig farms.
26. The method of the germ free semen collection in the boar and stallion.
27. Artificial insemination in the mare (estrus detection, technical procedures and determination of optimal time of AI).
28. Artificial insemination in the pig (estrus detection, technical procedures and determination of optimal time of AI).
29. Possibilities and limitations in induction of multiple ovulation in sow and mare.
30. Embryo transfer in pig and horse.

IV.

Small animal reproduction

1. Comparative anatomy of the genital tract in bitch and queen.
2. The malformations of the genital tract and disorders of sexual differentiation in carnivores.
3. The oestrous stages of the bitch and the hormonal background of the heat.
4. The oestrous stages of the queen and the hormonal background of the rolling.
5. Methods of oestrus induction useable in bitch and queen. Evaluate them in point of view of practical usefulness!
6. Methods to prevent and terminate the unwanted pregnancy in bitch and queen. Evaluate them in point of view of expected side-effects!
7. The principles of neutering of carnivores and the complications of intervention.
8. The short and long acting complications and side effects of the neutering of carnivores.
9. Compare the differences and analogies of dog and cat pseudopregnancy!
10. The methods for determination of optimal mating time in bitch depending on the insemination technique or natural breed.
11. Compare the differences and analogies of dog and cat pregnancy!
12. Methods to diagnose pregnancy in bitch and queen.
13. The clinical signs of approaching parturition. Compare advantages and disadvantages of proper methods for determination of optimal time of caesarean section in dog and cat!
14. The potential reasons of distochia, the clinical signs and the feasible treatments in dog and cat.
15. The principles of neonatal care in dogs and cats and the nursing feasibilities of orphan puppies and kittens.
16. Periparturient metabolic disorders in dog.
17. The typical diseases of post partum period, clinical signs and potential preventive and therapeutic interventions in dog and cat!
18. Mammary tumours in dog and cat.
19. The non-neoplastic disorders of mammary gland in dog and cat.
20. Ovarian and uterine tumours in dog and cat.

21. Reasons behind the process narrowing the vaginal cavity, clinical signs of them and the possible treatments in dog.
22. Inflammatory diseases of the vagina and possible therapies in dog.
23. The pathophysiology and types of pyometra/HGCE complex in dog and cat.
24. The clinical signs and complications of pyometra/HGCE complex in dog and cat.
25. The therapeutic feasibilities, especially the conservative therapies of pyometra/HGCE complex in dog and cat.
26. Infectious and non-infectious causes of infertility in male and female carnivores.
27. The diseases of the prostate and the diagnostic and therapeutic options in dog.
28. The congenital and acquired diseases of the testicle and the diagnostic and therapeutic options in dog and cat.
29. Methods of semen collection and evaluation in dog, cat and rabbit.
30. The feasibilities of artificial insemination in dog, cat and rabbit.

V.

Andrology. Assisted reproduction in ruminants. Biotechnology. Udder health.

1. Comparative anatomy of the male reproductive system in domestic mammals.
2. Developmental abnormalities of the male gonads. Impotencia coeundi and generandi. Anaphrodisia in male animals.
3. Neuroendocrine regulation of the males' sexual function. The male sexual reflexes..
4. Cytogenic function of the testis. Physiology of the epididymis, the accessory sexual glands and the seminal plasma.
5. Pathology and malfunctions of the testis and the accessory sexual glands (horse, ruminants, pig).
6. Pathology and malfunctions of the epididymis and prostate (horse, ruminants, pig).
7. The method of the germ free semen collection in bull and ram.
8. Macroscopic and microscopic examination and evaluation of the semen. The objective evaluation of the semen quality.
9. Impairments in production, movement and morphology of sperm cells.
10. Biological examination of the sperm cells (longevity, biochemical parameters, penetration test).
11. Dilution, preservation and storage of the semen. Differences between domestic species.
12. Induction of multiple ovulation (superovulation) in ruminants.
13. Embryo transfer in the cow and sheep.
14. Principles of in vitro fertilization.
15. Principles and method of embryo freezing.
16. Biotechnological manipulation of the mammalian embryos: transgenic animals, cloning, sex determination.
17. Principles in production of sex-determined semen. Vasectomy and other methods producing teaser animals in various species.
18. Anatomy of the udder. Physiology and endocrine regulation of milk secretion and the milk ejection reflex.
19. Pathogenesis of mastitis. Antimicrobial self-defence mechanisms in the udder.
20. Markers of inflammation in the milk. Diagnosis of mastitis.

21. Various types of mastitis. Characteristics of the most important pathogens of contagious and environmental origin.
22. Principles of treatment of various forms of mastitis. The summer mastitis and mastitis caused by Mycoplasmas and Prototheca zopfii.
23. Mastitis caused by Staphylococcus aureus.
24. Mastitis caused by Gram-negative bacteria.
25. Mastitis caused by various Streptococci.
26. The most important elements of a herd level udder health program in case of contagious mastitis herd problem.
27. The most important elements of a herd level udder health program in case of environmental mastitis herd problem.
28. Elements of an udder health survey; risk assessment, risk analysis. (General hygiene, environment, animals, milking parlour.)
29. Good milking practice and the most common mistakes.
30. Good udder health practice and the most common mistakes.