

QUESTIONS FOR FINAL EXAM IN VETERINARY GENETICS AND ANIMAL BREEDING

1. Veterinary genetics

1. Domestication of species (fundamentals, ancestors, dates, locales, consequences in geno- and phenotype, production and reproduction)
2. Organization of domestic animal breeding: breeding organizations, herd booking, trait recording, methods of marking, individual identification
3. Principles and laws of Mendelian genetics, exceptions, most important major genes in animal breeding
4. Sex determination, sex-linked, sex-limited and sex-influenced traits and inheritance, prolificacy genes in domestic animals, chicken sexing, and autosexing character
5. Genetic diseases and defects (genetic nature, causes, diagnosis, prevention)
6. Lethal gene mutations in animal breeding
7. Immunogenetics, biochemical and DNA polymorphism (blood groups, proteins, MHC, microsatellites)
8. Polygenic inheritance, environmental effects, genotype-environment interaction, threshold value and traits
9. Gene diagnosis in animal breeding and veterinary medicine (production and disease genes)
10. Coat colour inheritance in domestic animals (basic colours, albinism, horse and dog)
11. Qualitative population genetics in animal breeding (monogenic traits, Hardy-Weinberg law)
12. Quantitative population genetics in animal breeding (polygenic traits, heritability, Galton's regression, QTL)
13. Theory and practical methods of selection (selection parameters and indexes, correlation, Galton's regression)
14. Breeding value, methods of estimation (additive gene effects, CC, MCC, BLUP, AM)
15. Breeding methods and mating systems: purebreeding, crossbreeding, heterosis
16. Importance of evaluation of conformation (judging) and types in animal breeding
17. Technology (milk, meat and egg production systems, GCE) in animal breeding: Genetics, Care (feeding, housing, equipments, animal health), Economy (marketing)
18. Artificial insemination (AI), semen deep freezing and its importance in animal breeding
19. Embryo transfer (MOET, ET), embryo manipulations and cloning (OPU, IVM, IVF, IVC, GMO) in animal breeding
20. Genetic diversity, endangered breeds, conservation of genetic resources in animal breeding

2. Cattle, sheep and goat breeding

1. Domestication of cattle, micro-evolutionary consequences
2. Breeding goals and characteristics (traits) of dairy cattle, milk properties
3. Breeding goal and characteristics (traits) of beef and dual purpose cattle
4. Dairy cattle breeding technologies, milk production and hygiene
5. Elements of beef cattle breeding technologies
6. Main reproduction features, reproduction parameters of cattle
7. Most important bovine genetic diseases
8. Dairy cattle breeds (classification, characteristics, types), production of consumption and industry milk
9. Beef cattle breeds (characteristics, classification, beef cattle types), beef quality
10. Breeding methods in cattle production (improvement, selection response when improving meat and dairy type, pure, line and family breeding, crossbreeding)
11. Estimation of breeding value in dairy cattle production, importance of udder evaluation
12. Estimation of breeding value in beef cattle production
13. Origin and domestication of small ruminants (sheep and goat), their species characteristics
14. Breeding goals and traits of sheep and goat production, types, usage and products
15. Wool producing sheep and goat breeds, structure and characteristics of wool
16. Meat (mutton, chevon) sheep and goat breeds, fur producer sheep breeds
17. Milk type and prolific sheep and goat breeds, prolificacy genes, milk properties
18. Reproduction features, reproduction, prolificacy and fertility traits, most important genetic diseases of sheep and goat
19. Breeding (pure and cross breeding) methods and practical mating systems in sheep and goat production
20. Sheep and goat breeding technologies, production and management systems (extensive, intensive)

3. Horse, dog, cat breeding

1. Evolution and domestication of the horse, micro-evolutionary consequences
2. Breeding goals and use in horse breeding, most important performance traits (race, sport, others)
3. Marking and identification of the horses, principal coat colours and inheritance, the behavioural vices
4. Main reproduction features and parameters of the horse (breeding season, AI, raising foals)
5. Most important genetic diseases of the horse
6. The role of training and racing in horse breeding. Judging of conformation, the gaits

7. Horse races (race horses), horse sports, riding, coach driving (sport horses)
8. Technology of race- and sport horse breeding. Genetic improvement of race and sport horses
9. Arabian origin horse breeds and other Arabian blooded descendents
10. The English Thoroughbred, the trotters and Thoroughbred blooded sport horses
11. Spanish horses and Spanish blooded descendents
12. Cold blooded (heavy draught) horses, ponies and small horses
13. Dog and cat domestication, micro-evolutionary consequences, relatives and interspecies hybrids
14. Basics of canine breeding (goals, use, conformation and judging, breeding methods)
15. Dog breeds, breed groups
16. Canine reproduction features
17. Most important canine genetic diseases
18. Basics of feline breeding (goals, use, breeds, breeding methods)
19. Feline reproduction features
20. Most important feline genetic diseases

4. Swine and poultry breeding

1. Origin and domestication of swine, micro-evolutionary consequences: importance of pork production in human nutrition
2. Most important traits of pig production (prolificacy, fattening ability, carcass quality, meat/fat properties, SEUROP qualification system), breeding value estimation and selection of sows and boars
3. Classification of swine breeds, types, the main aspects of judging swine conformation (and type)
4. The Yorkshire (the large white) breed group of swine
5. The Landrace breed group of pigs
6. The colour pig breeds (Piétrain, Duroc and Hampshire)
7. Importance of Asian and other local swine breeds
8. Breeding methods and practical mating systems in swine breeding: continuous and discontinuous crossings and hybridization
9. Reproduction features and parameters of swine, raising piglets,
10. Most important porcine genetic diseases (PSS, MHS, PSE)
11. Technology of swine production (modern, large unit, traditional, alternative)
12. Origin and domestication of different poultry species, micro-evolutionary consequences, importance of meat and egg production of different poultry species in human nutrition
13. Main reproduction features of poultry species, puberty, breeding maturity, most common genetic diseases
14. The layer hen type (breeding goal, use, breeds, traits, breeding methods and hybrids)
15. Broiler chicken (breeding goal, use, breeds, traits, breeding methods and hybrids)
16. Poultry production systems and technologies (large unit, traditional, alternative, get-away)

17. Breeding turkey (breeding goal, use, breeds, traits, breeding methods and hybrids)
18. Breeding goose (breeding goal, use, breeds, traits, breeding methods and hybrids)
19. Breeding ducks (breeding goal, use, species, breeds, traits, breeding methods and hybrids)
20. Breeding pigeon (breeding goal, use, breeds, traits, breeding methods and hybrids)