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DEPARTAMENT: ANIMAL PRODUCTIONS AND PUBLIC HEALTH

DISCIPLINE: VETERINARY HYGIENE AND ENVIRONMENT PROTECTION

Courses holder: Associate Professor Florin Furnaris, DVM, PhD

TOPICS AND REFERENCES

General considerations: Veterinary Hygiene and Environment Protection definition, The field of study of Veterinary Hygiene and Environmental Protection, The methods of study in Veterinary Hygiene field: slides 3, 6-11, 16, 18

Air hygiene: Atmosphere definition, Layers of atmosphere, Air composition - normal air gases, air dust - air particulates, microorganisms, Air properties and their influence upon animals, air temperature, air humidity - influence of air humidity upon animals, precipitations and the influence of precipitations upon animals, air pressure and the influence upon animals, air movement and influence upon animals, solar radiations and their influence upon animals, air ionization and air ions influence, air electric field, thunderstorm electrical phenomena, condensation nuclei, Complex meteorological factors, weather and weather influence, climate and the influence upon animals: slides 21, 22, 24-27, 28-31, 33-34, 36, 37, 39, 42-45, 47-50, 51, 52, 54, 56, 60, 61, 63, 65, 67, 70, 71, 73, 75-78, 80-86, 88, 90

Soil hygiene: The role of the soil, sole action upon animals, Chemical composition of the soil, Physical properties of the soil, Living elements in the soil, Soil pollution, assessing the soil pollution, soil self purification: slides 96-98, 99-103, 105-108, 110, 112, 117-120

Water hygiene: water role, water in nature, World resources of fresh water, Sources of water (rainwater, surface water, ground water). Properties, Water pollution. Methods for assessing the degree of water pollution and self-purification: slides 129, 130, 133, 135, 136, 138, 139, 141, 142, 146-149, 154-157

Animal housing: General considerations - Housing advantages and disadvantages, Requirements in choosing the farm location, Pollutants produced by animal farms, Farm organizing, Hygiene requirements for stables' building materials, Hygienic requisites concerning construction elements, Animal houses classification, Elements of the houses - Closing elements, Foundation, Outer walls, Ceiling, Roof, Windows, Floor. Floor classification, Bedding - litter, Inner space division elements (s190): slides 160, 162-164, 166-169, 172, 173, 174, 177-179, 184, 187-189

Microclimate of animal houses: Physical factors, Chemical microclimate factors, The microclimate biological factors, The level of microclimate factors, The overall assessment of the microclimate: slides 194, 195, 197, 198, 200-203, 206-209

Animal feeding systems: Facilities and equipment for horse feeding, Facilities and equipment for cattle feeding. Feeding of dairy cows. Feeding of the calves. Feeding of the veals, Equipment and installations for pigs feeding, Facilities and equipment for poultry feeding: hens in deep-litter system, hens in battery cages, hens in alternative system,

Feeding systems for waterfowl, ostriches, fur animals, rabbits, Feeding systems for dogs and cats: slides 212, 213, 215, 218, 219, 223-228, 230-234, 236, 237

Animal transportation: General considerations regarding animal transportation, Documents for animal transportation, Provisions for vehicles, Conditions for transport: animal fitness, Condition for transport: means of transport, Conditions for transport: animal loading and unloading points, Transportation by different means: slides 243-247, 250, 253, 254, 256-258, 260, 263, 264, 266-269

OVERALL: 158 slides (equivalent to 79 pages: text, images, schematics, tables)

References: Furnaris Florin - Veterinary Hygiene and Environment Protection, Lecture notes (online: <https://animalwelfare.ro/files/vet-hyg-lic/VMen 7VETERINARY HYGIENE lic22.pdf>)
QUESTIONNAIRE

Questions with five possible answers, of which only one is correct.

- 1 Veterinary hygiene and environmental protection is the science which approach:**
 - a) the complex relations between animals' behavior and animal health
 - b) the complex relations between animal organism and environment and promote the action of negative environmental factors
 - c) the diagnosis and the treatment of internal medicine diseases and disorders
 - d) the complex relations between hosts and parasites
 - e) the complex relations between animal organism and environment in order to ensure good animal welfare, raise the animal productions level, prevent the transmission of diseases from animals to human
- 2 The control of epidemic diseases is achieved through:**
 - a) control program (screening, prevention, treatment)
 - b) consumer awareness programs
 - c) animal research programs
 - d) eradication programs
 - e) programs for water quality monitoring
- 3 Concerning the higher and higher demands of the foodstuff consumers and the general public, the guarantee for food safety and quality is ensured by applying the system (the concept):**
 - a) from stable to table
 - b) first in - last out
 - c) all in - all out
 - d) battery cages system
 - e) saprobic system
- 4 According to the new expanding of the disease concept, can be considered conventional disease:**
 - a) an injury
 - b) self-mutilation behavior
 - c) an infectious disease
 - d) food control
 - e) earth sickness
- 5 The use of rearing (animal husbandry) systems that doesn't imply vaccination or growth hormones and antibiotics is in compliance with:**

- a) the higher demands in international trade
- b) the new expanding of the disease concept
- c) the necessity to extend the field of veterinary hygiene
- d) the higher demands of the consumers and the general public
- e) the appropriate biosecurity level in farms

6 Among the methods of study in veterinary hygiene field, the physical methods (physical analysis) framing within:

- a) the methods for studying the animal biochemical profile
- b) the methods for study the environmental factors
- c) the statistical and mathematical methods
- d) the Willis methods
- e) the serial dilution methods

7 According to ISAH definition, animal hygiene is the scientific interdisciplinary field intertwining animals' and humans' health and:

- a) food safety
- b) freedom from discomfort
- c) welfare
- d) biosecurity
- e) life diversity

8 In which layer of the atmosphere the maximum amount of ozone can be found (ozonosphere - ozone layer):

- a) troposphere
- b) stratosphere
- c) mesosphere
- d) exosphere
- e) magnetosphere

9 Which layer of the atmosphere contains 90% of water vapors quantity, of air dust and microorganisms:

- a) the exosphere
- b) the ionosphere
- c) the thermopause
- d) the mesosphere
- e) the troposphere

10 Atmosphere is a complex mix of:

- a) gases, water vapors, dust, microorganisms, radioactive particulates
- b) various gases
- c) gases and water vapors
- d) gases, water vapors, mycotoxins
- e) complex organic compounds containing sulfur

11 In which layer of the atmosphere are noticed high speed air movements?

- a) thermosphere
- b) ionosphere
- c) mesosphere
- d) stratosphere
- e) capillarity zone

12 Which is the atmospheric layer ranging from a height of 80 km to a height of 1000 km above the terrestrial level?

- a) thermosphere

- b) exosphere
- c) biosphere
- d) troposphere
- e) mesosphere

13 In which layer of the Earth atmosphere is included the ionosphere?

- a) thermosphere
- b) mesosphere
- c) troposphere
- d) chromatosphere
- e) ozonosphere

14 In the ozonosphere, there are recorded temperatures of:

- a) -273°C to -270°C
- b) 2000°C to 2100°C
- c) 70°C to 75°C
- d) -95°C to -90°C
- e) -56.5°C

15 The normal concentration of oxygen in the atmosphere is:

- a) 78.08%
- b) 20.95%
- c) 10%
- d) 0.03%
- e) 0.93%

16 The normal concentration of nitrogen in the atmosphere is:

- a) 78.08%
- b) 20.95%
- c) 10%
- d) 0.03%
- e) 0.93%

17 Increase of atmospheric pressure may result in the increase of the nitrogen blood amount and subsequently to:

- a) hyperexcitability
- b) hypobaric seizures
- c) hyperbaric narcosis
- d) coniosis
- e) immune system stimulation

18 Regarding the oxygen in the air, life is possible as long as its concentration is higher than:

- a) 11-12%
- b) 5%
- c) 78.08%
- d) 0.03%
- e) 7%

19 Hemoglobin is a carrier protein with very high affinity in oxygen binding, 1 g of hemoglobin binding:

- a) 0.5 cc of oxygen
- b) 1.33 cc of oxygen
- c) 500 cc of oxygen
- d) 1 µl of oxygen

e) 1.33 nm of oxygen

20 Choose a disorder recorded at altitude greater than 6000 m:

- a) mountain sickness
- b) coniosis
- c) extreme altitude hypoxia
- d) hyperbaric narcosis
- e) cyclonopathy

21 The main cause of greenhouse effect (associated with global warming) is:

- a) ozone
- b) ammonia
- c) carbon dioxide
- d) oxygen
- e) calcium oxide

22 Ozone is an allotropic form of:

- a) nitrogen
- b) hydrogen
- c) hydrogen peroxide
- d) carbon
- e) oxygen

23 The Montreal Protocol is an International Agreement to reduce the usage of chemical substances implied in the:

- a) depletion of the ozone layer
- b) depletion of the ionosphere
- c) impairing the wildlife and the natural habitats
- d) decreasing of the nitrogen
- e) depletion of the oxygen

24 The reduced oxygen supply in tissues (the tissues' lack of oxygen) is called:

- a) hypoxemia
- b) hypercapnia
- c) hypoxia
- d) rumenitis
- e) hyperbarism

25 According to Gibbs, air dust (air particulates) can be classified in:

- a) Organic and inorganic particulates
- b) Flugge droplets, droplet nuclei and organic dust
- c) Coarse particulates, fine particulates and ultrafine particulates
- d) Common dust, cloud and smoke
- e) 10 classes of quality

26 The highest prevalence of conioses can be recorded:

- a) for digestive system
- b) for the respiratory system
- c) for the nervous system
- d) for the locomotor system
- e) for H.A.C.C.P. system

27 The main action of dust with charcoal and petroleum compounds is:

- a) photodynamic effect
- b) fibrotic effect
- c) immunogenic effect

- d) oncogenic effect
- e) allergic reaction

28 Flugge droplets, as a form of microorganisms' presence in the air, are implied in disease transmission by:

- a) airborne transmission
- b) telluric transmission
- c) vector transmission - vector borne diseases
- d) allergic reactions
- e) direct contact

29 Carried by Flugge droplets, the pathogens can disperse to a maximum distance of:

- a) 1 km
- b) 2.5 km
- c) 5 m
- d) 20 m
- e) 10 m

30 Among the following indicators, state the one used in the usual examinations for establishing air contamination with human or animal origin microorganisms:

- a) total number of bacteria developing at 37 °C
- b) total number of bacteria developing at 24 °C
- c) total number of *Bifidobacterium asteroides* bacteria
- d) total number of *Amanita muscaria* spores
- e) total number of bacteria developing at 8 °C

31 Turbulence is an air warming phenomenon defined as:

- a) rise of the warmer air placed next to the terrestrial surface and its replacement with colder air from altitude
- b) heat transmission from warmer air masses to other close, colder air masses
- c) a disorderly air motion in all directions
- d) heat flow from the Earth surface to the atmosphere
- e) water vapors condensation which results in air warming

32 Molecular thermal conductivity is an air warming phenomenon defined as:

- a) rise of the warmer air placed next to the terrestrial surface and its replacement with colder air from altitude
- b) warming of a thin layer of air of 4 - 5 cm near the terrestrial surface
- c) heat transmission from warmer air masses to other close, colder air masses
- d) a disorderly air motion in all directions
- e) water vapors condensation which results in air warming

33 Air temperature in outdoor conditions is measured in shadow, at a height of:

- a) 5-10 cm
- b) 10 m
- c) 2 m
- d) 8 m
- e) 0.5-0.7 m

34 Adiabatic expansion can be classified as:

- a) an air warming phenomenon
- b) a form of soil degradation
- c) a form of water secondary pollution
- d) the working principle of the light meters
- e) an air cooling phenomenon

- 35 The sensible heat can result in from 3 routes, namely radiation, thermal conduction and:**
- a) evaporation
 - b) advection
 - c) convection
 - d) eutrophication
 - e) desalination
- 36 The latent heat (insensible heat loss) represents the heat transfer from the animal to the environment by:**
- a) water evaporation
 - b) radiation
 - c) thermal conduction
 - d) convection
 - e) skin insulation
- 37 The process by which an animal copes (adjusts) to higher temperature of the environment, is called:**
- a) thermogenesis
 - b) thermal cautery
 - c) thermal anemometers
 - d) homeothermy
 - e) thermolysis
- 38 The air temperatures frame (interval) in which the animal internal temperature remains stable with a minimum engage of thermal regulation system is called:**
- a) upper critical temperature
 - b) thermal neutral zone
 - c) zone of homeothermy
 - d) the life-possible temperatures zone
 - e) thermal electrical effect
- 39 Animal adjustments in cold condition DOESN'T include:**
- a) gathering
 - b) head-under-wing position
 - c) ruffling
 - d) peripheral vasoconstriction
 - e) wing-fluttering and waving
- 40 In foals and calves, the thermal regulation system is completely developed at:**
- a) day 40 of life
 - b) 2-3 months
 - c) first day of life
 - d) day 3 of life
 - e) 10 days
- 41 The joint action of low air temperature and high humidity generates:**
- a) frostbite, necrosis
 - b) a frigore and rheumatoid diseases
 - c) hyperthermia
 - d) heat stroke
 - e) telluric diseases
- 42 The high temperatures, the high humidity and the low-speed air draughts can lead to death in birds, when the internal temperature exceeds:**
- a) 40 °C

- b) 43 °C
- c) 46 °C
- d) 20 °C
- e) -8 °C

43 Specify the item which is NOT an air humidity term:

- a) hygroscopicity
- b) relative humidity
- c) absolute humidity
- d) maximum humidity
- e) dew point

44 The frostbites' appearing is facilitated in low temperatures' condition and low relative air humidity values, below:

- a) 5 Lx
- b) 500 RLU
- c) 40%
- d) 75%
- e) 90%

45 The synthetic index reflecting the relation between temperature and humidity and their joint action upon organism is called:

- a) chill index
- b) heat index
- c) color render index
- d) indoor air quality index
- e) required thermal insulation index

46 High air humidity:

- a) facilitates the development of microorganisms, parasites and intermediate hosts
- b) may result in frostbites appearing on ear or tails
- c) may result in crowding syndrome
- d) may result in obtaining safe and mycotoxins - free vegetal products
- e) may result in reducing the number of bacteria in the air

47 A form of precipitation generated on terrestrial surface is:

- a) fog
- b) rain
- c) drizzle
- d) dew
- e) hail

48 Concerning the cloud coverage - the extent to which the sky is obstructed by clouds, can be described as sunny days the days with:

- a) 10 conventional degrees
- b) 0-7.5 conventional degrees
- c) 7.6-10 conventional degrees
- d) 0-3.5 conventional degrees
- e) greater than 60 conventional degrees

49 A line connecting points (places) on a geographic map having equal rainfall at a certain time or for a specific period is called:

- a) isohyet
- b) isotherm

- c) isobar line
- d) isotropic
- e) skyline

50 Glaze can cause:

- a) an increasing of endoparasitic diseases prevalence
- b) bone fractures, abortion
- c) digestive disorders - colic, indigestion, bloat
- d) coniosis
- e) cloud-to-cloud lightning

51 Concerning air pressure influence upon animals, blood oxygen ranges normal values (has very good value) in altitudes:

- a) greater than 3500 m
- b) greater than 500 m
- c) up to 360 m
- d) between 2000 and 3400 m
- e) up to 200 cm

52 The following scale is used to asses the wind strength (intensity):

- a) Beaufort scale
- b) Reaumur scale
- c) Grandin scale
- d) Mohs scale
- e) Petkov scale

53 The Beaufort scale has:

- a) 12 degrees
- b) 10 conventional degrees
- c) 5 degrees
- d) 9 degrees
- e) 50 degrees

54 Regarding the increasing of animal heat losses due to wind direct influence, the highest loss value can be found:

- a) at an angle of 90 °
- b) at an angle of 30 °
- c) at an angle of 15 ° F
- d) at an angle of 2%
- e) at an angle of 90 ° K

55 Ultraviolet radiations have wavelength of:

- a) 700-2500 nm
- b) 1-10 mm
- c) 150-400 nm
- d) 400-780 nm
- e) 780-3000 nm

56 α and β radiations are:

- a) corpuscular radiations
- b) electromagnetic radiations
- c) types of infrared radiations
- d) types of ultraviolet radiations
- e) microwaves of 7 mm wavelength

57 Microwaves have wave lengths ranging:

- a) 0.001-100 nm
- b) 150-400 nm
- c) 5-10 km
- d) 1-10 mm
- e) 5-10 μ m

58 Actinotherapy for wounds healing stimulation uses mainly the positive effect of:

- a) α radiation
- b) ultraviolet radiation
- c) β radiation
- d) visible light
- e) gamma radiation

59 From retina, light stimuli can be directly transmitted to hypothalamus and limbic system by:

- a) Arnold's nerve
- b) Frey pathways
- c) Phrenic nerve
- d) Radial nerve
- e) Airborne transmission pathway (route)

60 The period of dark within 24 hours is called:

- a) solstice
- b) phototaxis
- c) photoperiod
- d) chemoperiod
- e) scotoperiod

61 The implication of the visible light in photosynthesis (plant conversion of the light energy into chemical energy) is one of the visible light:

- a) informational effect
- b) allergic action
- c) immunogenic reaction
- d) irritative action
- e) energetical action

62 The lifetime of small air ions in clean air is:

- a) 20 minutes
- b) 1 second
- c) 72 hours
- d) 30 days
- e) 20 years

63 Air ionization can be measured by:

- a) light meters
- b) sound meters
- c) Arago Davy psychrometers
- d) Ebert and Gardien electro-meters
- e) sling psychrometers

64 Via physical and biological mechanisms, the negative air ions:

- a) increase the total number of bacteria in the air
- b) inducing stress (distress)
- c) reduce the total number of bacteria in the air
- d) inhibit the thyroid and the pituitary glands secretion
- e) stimulate thermogenesis

65 Concerning air electric field, chose the gradient value for fine weather conditions:

- a) 20'000 V/m
- b) 2 g / cc
- c) 500 g / sqm / 30 days
- d) 90 °F
- e) 120 - 150 V/m

66 Air electric field:

- a) bypasses altitude differences and large objects including animal houses
- b) doesn't bypass altitude differences and large objects
- c) causes the dew formation
- d) has a major influence upon the prevalence of the parasitic diseases
- e) has a major influence upon the light intensity in the animal house

67 CG lightning:

- a) is an electric discharge within layered clouds
- b) is an electric discharge between clouds and the Earth's surface
- c) is an electric discharge between unlayered clouds with opposite electrostatic charge
- d) is a natural lighting system in animal husbandry
- e) is an animal feeding system

68 Lightning strike is caused by:

- a) IC lightning
- b) Cloud-to-cloud lightning
- c) CG lightning
- d) Water sublimation on condensation nuclei
- e) Lichtenberg figures

69 Highlighting the venous arborization - a high predictive sign of lightning strike in human is called:

- a) Lichtenberg figures
- b) Hoffmann figures
- c) Khlebnikov signs
- d) Gibbs figures
- e) Grandin signs

70 Condensation nuclei are:

- a) coarse particles (PM10-2.5)
- b) fog
- c) smog
- d) air dust (air particulates)
- e) solid particles suspended in the air, the cause of precipitation

71 Weather is:

- a) the physical state of the atmosphere at a certain time
- b) all the meteorological elements of the atmosphere in a certain space for a long period
- c) the process of formation and evolution of electrical charged particles
- d) the upper layer of the Earth's surface
- e) the field of study of animal nutraceutical

72 Choose an anticyclone bellow:

- a) Mediterranean Low
- b) Icelandic Low
- c) Saharan Low
- d) Siberian High

e) Azores Middle

73 Neuroses, neuralgia and migraines are:

- a) anemopathies
- b) cyclonopathies
- c) visible light positive effects
- d) sebaceous glands disorders
- e) common infectious diseases

74 The alpin (alpine) climate ranges:

- a) in altitudes lower than 500 m
- b) at sea-level
- c) in altitudes higher than 1000 m
- d) in altitudes of 500-1000 m
- e) only in Alps and Rocky Mountains

75 Soil is NOT:

- a) base for animals and shelters
- b) storage place of nutrients
- c) the main cause of greenhouse effect
- d) supplier of nutrients for plants and animals
- e) purifying system - converting any kind of residues

76 Occurrence of injuries in the contact areas (pressure ulcers or bedsores) is:

- a) a soil direct action
- b) a soil indirect action
- c) a water direct action
- d) an air indirect action upon animals
- e) a form of eutrophication

77 The telluric diseases are transmitted by:

- a) air
- b) water
- c) soil
- d) contact
- e) wind

78 Healthy soils are:

- a) located on low altitude
- b) located on wet and floodable lands
- c) located on cold lands
- d) located on sunny lands
- e) contaminated soils

79 Diseases correlated with soil excess or/and deficiency in mineral elements are called:

- a) telluric diseases
- b) geochemical endemic diseases
- c) airborne diseases
- d) coniosis
- e) salinization

80 The following statement is true for the acidic pH soils:

- a) the activity of microorganisms is inhibited
- b) plants growing on such soils are balanced in term of chemical composition
- c) can be obtained higher yields per hectare

- d) the growth of microorganisms is favored
- e) they can generate H.A.P.E.

81 Among the Hoffman areas of water distribution in the soil structure, the upper zone is represented by:

- a) the filtration zone
- b) the forbidden zone
- c) the capillarity zone
- d) the real zone of groundwater
- e) the evaporation zone

82 Capillary pores in the soil have diameter:

- a) greater than 10 cm
- b) greater than 2 mm
- c) less than 2 mm
- d) less than 10%
- e) greater than 2 cm

83 Permanent or autochthonous bacteria in soil are:

- a) bacteria brought in soil by organic fertilizer
- b) bacteria which increase in number when fertilizers are applied
- c) bacteria invading the soil habitat, entering by fertilizers, animal manures, corpses
- d) microorganisms pathogenic to humans
- e) bacteria adapted to unfertilized soil

84 The maximum persistence in the soil of the vegetative bacteria form and the sporulated bacterial form are:

- a) 4-10 weeks, 20 years
- b) 2 days and 30 days, respectively
- c) 20 minutes and 3 hours, respectively
- d) 1 week, 2 years
- e) similar for the two bacterial forms, 20 days

85 Regarding the microorganisms (bacteria) distribution in the soil, the largest number can be found:

- a) from the surface to a depth of 2-3 cm
- b) at 4-30 cm depth beneath the ground level
- c) at depth more than 3 meters
- d) at depth more than 15 m
- e) in the troposphere

86 From the processes bellow, choose the one which is NOT a soil degradation form:

- a) erosion
- b) compaction
- c) desertification
- d) salinization
- e) eutrophication

87 Regarding soil pollution with street sweeping wastes, the wastes resulting in markets have values of:

- a) 15 mg / cm
- b) 17 g / sqm / 30 days
- c) 1 cm / 1000 sqm / day
- d) 10 l / 1000 sqm / day
- e) 2 g / 1000 cm / day

88 Special wastes implied in soil pollution can be considered:

- a) farmyard manure
- b) household wastes
- c) fodder leftovers
- d) residues generated by hospitals
- e) deep litter from germ-free animal shelters

89 Regarding the Khlebnikov index (the sanitary number), a value greater than 0.95 classifies the soil as:

- a) intense polluted
- b) mild polluted
- c) unpolluted
- d) average polluted
- e) the respective index concerns the air, not the soil pollution

90 The presence of *Cl. perfringens* (perfringens bacteria) in the soil and the lack of *E. coli* shows:

- a) an older or previous pollution
- b) a recent contamination
- c) doesn't indicate soil pollution
- d) indicate water radioactivity
- e) the infestation degree with parasitic elements

91 Bacteriophages can be used to accurately specify the moment of soil pollution. In the case of organic pollution, first time can be encountered:

- a) Coli phages
- b) SS phages
- c) Vibrio phages
- d) Bacillus phages
- e) Aspergillus phages

92 In autumn or in spring, the soil self-purification process:

- a) lasts 5 days
- b) lasts 10 days
- c) lasts 60 days
- d) stops
- e) lasts 24 hours

93 In animal husbandry, water:

- a) has only a biological role - as nutrient
- b) has ecological and saprobic role
- c) has biological role and technological role
- d) has ecologic role and toxicologic role
- e) doesn't have any role

94 From the total amount of water covering the Earth, the atmospheric water represents:

- a) 2.15%
- b) 3%
- c) 0.01%
- d) 97.2%
- e) 50%

95 From the total amount of water covering the Earth, the sea and ocean water represents:

- a) 2.15%
- b) 3%
- c) 0.01%

- d) 97.2%
- e) 50%

96 From the world resource, fresh water used in industry represents a percent of:

- a) 90%
- b) 5%
- c) 1%
- d) 70%
- e) 25%

97 World Health Organization estimates that the biologic water need is:

- a) 5 l / day / citizen
- b) 100 l / day / citizen
- c) 20-70 l / day / citizen
- d) 200 cc / day / citizen
- e) 5 cm / day / citizen

98 The third (the last) moment in rainwater pollution is:

- a) eutrophication
- b) when precipitations are forming on condensation nuclei
- c) when touching the ground (the soil)
- d) when precipitation falls (atmosphere washing)
- e) when is collected and used without processing as drinking water source

99 Among flowing water bodies (streams), torrents can be described as:

- a) permanent
- b) accidental
- c) artificial channels
- d) rivers
- e) intermittent

100 For backwater (stagnant water bodies), different smell and taste changes can occur mainly due to:

- a) phytoplankton and zooplankton overgrowth
- b) pollution with heavy metals
- c) pollution with PAH
- d) salinization
- e) pollution with carbon dioxide

101 Wetlands (swamps, mires, marshes) are accumulations of water in Earth's crust hollows with depth:

- a) greater than 20 m
- b) below 5 m
- c) below 2 km
- d) less than 20 cm
- e) less than 1 km

102 In term of the aquifer layer depth, groundwater can be classified as:

- a) phreatic water and high depth groundwater
- b) streams, backwater and wetlands
- c) in four quality classes
- d) sparkling and still mineral water, medicinal water, thermal water
- e) permanent, intermittent, accidental bodies of water

103 For the phreatic water, the water layer depth ranges:

- a) 5-50 m

- b) 10-100 m
- c) 1-10 m
- d) 2-20 m
- e) 50 cm-7 m

104 Choose a specific item implied in the water pollution with organic micropollutants:

- a) Phosphates
- b) Eutrophication
- c) Mercury
- d) Aluminium
- e) Detergents

105 In 4th quality class water, according to saprobic system, the number of bacteria:

- a) is less than 10'000 / ml
- b) is less than 100 / ml
- c) is less than 100'000 / ml
- d) exceeds 1 million / ml of water
- e) exceeds 300 / ml of drinking water

106 In the third quality class water, according to saprobic system, can be found:

- a) polysaprobic organisms
- b) alfa-mesosaprobic organisms
- c) beta-mesosaprobic organisms
- d) gamma-mesosaprobic organisms
- e) oligosaprobic organisms

107 In the first quality class water, according to the saprobic system, the number of bacteria:

- a) is less than 10,000 / ml
- b) is less than 100 / ml
- c) is less than 100,000 / ml
- d) exceeds 1 million / ml of water
- e) exceeds 300 / ml of drinking water

108 Choose a disadvantage (a drawback) of animal housing:

- a) ensuring the optimal microclimate
- b) reducing animal locomotion
- c) the easier surveillance of the livestock
- d) protecting the animal from the negative action of the excessive environmental factors
- e) the lack of possibility to proper perform the veterinary actions as vaccination and parasite control

109 Select the right requirement in choosing a good farm site:

- a) to have a slope of 1-3°
- b) to face North or North-East
- c) to lack nearby pastures
- d) to be crossed by high-voltage electric network
- e) to have land with low soil permeability

110 In Romania, the minimum distance farm-communities (city/village) for pig units is:

- a) 100 m
- b) 10 km
- c) 500-1'000 m
- d) 22 m
- e) 18 m

111 Odorant gases (smell gases) from farm generate discomfort and can be felt up to:

- a) 18 m distance from farm
 - b) 22 m distance from farm
 - c) 20 sqm distance
 - d) 1'000-1'500 m distance from farm
 - e) 15 km distance from farm
- 112 Concerning the first requirement in farm organizing - namely space isolation - the zone where livestock unit buildings are located is:**
- a) The Hoffman area
 - b) The protection area
 - c) The forbidden area
 - d) The screening area
 - e) The defense area
- 113 For ensuring a proper house lighting, the minimum distance between animal barns without outdoor access areas is:**
- a) 2 m
 - b) 3 m
 - c) 200 m
 - d) 15-30 m
 - e) 6-10 m
- 114 Thermal conductivity coefficient (k) for doors and windows in animal houses has values of:**
- a) 2-5 kcal / sqm / h / °C
 - b) 50 kcal / °C
 - c) 0.2 kcal / sqm / h / °C
 - d) 100 kcal / sqm / h / °C
 - e) 1 mcal / sqm / h / °C
- 115 For animal houses with natural lighting and ventilation, is not recommended that the width to be more than:**
- a) 18 m
 - b) 5 m
 - c) 12 m
 - d) 36 m
 - e) 20 cm
- 116 Choose a type of animal house which can be easily adapted to any site or livestock and has no permanent foundation:**
- a) common house
 - b) modular house
 - c) manufactured house
 - d) house with artificial lighting system
 - e) house with wind-driven ventilation
- 117 Choose a type of barn foundation which extends over the entire loaded area:**
- a) raft foundation
 - b) strip foundation
 - c) pad foundation
 - d) roof lights
 - e) wall footing
- 118 From the barn total amount of heat losses to the outside, the heat loss through the ceiling is:**
- a) 25%

- b) 1%
- c) 50%
- d) 100%
- e) 50 °F

119 The slope of flat roofs for animal houses is:

- a) 30%
- b) greater than 20%
- c) less than 45°
- d) less than 5%
- e) greater than 5 kPa

120 In adult horses, the required quantity of litter (bedding) is:

- a) 1 kg / day
- b) 4-8 kg / day
- c) 2 kg / day
- d) 0.1-0.2 kg / day
- e) 50 kg / day

121 Concerning the structure of the deep litter (deep bedding), the thickness of the used bedding material is:

- a) 5 cm
- b) 10-30 cm
- c) 40-50 cm
- d) 2-3 m
- e) 80-90 cm

122 The sanitary veterinary unit, smallest subdivision which ensures animal health surveillance, is:

- a) animal house
- b) animal house compartment
- c) pens, boxes, cubicles, cages
- d) troughs, walls and corner feeders
- e) nest boxes

123 Choose the right statement for the case of artificial ventilation with exhaust system:

- a) free air admission and forced air evacuation
- b) forced air admission and free air evacuation
- c) both air admission and evacuation are forced
- d) both air admission and evacuation are free
- e) the outside pressure is lower than the pressure inside the house

124 Regarding the noises in animal houses, the maximum admitted limits in houses in intensive husbandry system is:

- a) 50-60 dB
- b) 10 dB
- c) 80-90 dB
- d) 300 RLU
- e) 70 Lx

125 Which is the toxic level of carbon dioxide in the air of the animal houses?

- a) 10,000 ppm
- b) 5,000 ppm
- c) 3,000 ppm
- d) 1,000 ppm

- e) 2,500 ppm
- 126 The maximum admitted value for ammonia in the air of the houses for ostriches is:**
 - a) 10 ppm
 - b) 26 ppm
 - c) 4 ppm
 - d) 15 ppm
 - e) the admitted limit was not established
- 127 The maximum admitted limit for hydrogen sulfide in the air of the animal houses is:**
 - a) 4 ppm
 - b) 10 ppm
 - c) 26 ppm
 - d) 1000 ppm
 - e) 15 ppm
- 128 In animal houses, the maximum admitted limit for airborne microorganisms is:**
 - a) 300 / m³ of air
 - b) 12,500 / m³ of air
 - c) 1 million / m³ of air
 - d) 250,000 / m³ of air
 - e) 15 mg / m³ of air
- 129 Regarding the lighting in houses for dairy cows, the recommended value for natural lighting ratio (windows to floor area ratio) is:**
 - a) 1/20
 - b) 1/25
 - c) 1/8
 - d) 1/16
 - e) 5/1
- 130 According to Petkov' overall microclimate assessment scale, the inappropriate microclimate is considered the one having the final score of:**
 - a) 90 points
 - b) 90-100 points
 - c) 80 points
 - d) 70-90 points
 - e) less than 70 points
- 131 Equiball is:**
 - a) a trough for horses
 - b) a corner feeder
 - c) a device releasing the fodder when is pushed by the animals
 - d) a screw conveyor
 - e) a scrape conveyor
- 132 Simple troughs for cattle feeding have:**
 - a) six sides access
 - b) three sides access to fodder
 - c) access to the paddocks
 - d) two sides access to fodder
 - e) one side access to fodder
- 133 Choose a feeding device for cattle on pasture:**
 - a) circular hay rack
 - b) feeding belt

- c) scraper conveyor
- d) haystack
- e) small feed tanks

134 Until the weaning, the feeding of the calves can be done by using:

- a) troughs
- b) buckets with nipple
- c) hay racks
- d) fence mangers
- e) roller conveyors

135 Concerning the veals / beef calves, the finishing time for semi-intensive system is at the age of:

- a) 24 months
- b) less than 12 months
- c) 15-20 months
- d) 3 months
- e) 3 years

136 For the veals / beef calves in intensive system, the finishing time is at the age of:

- a) 12-15 months
- b) 8-12 months
- c) 15-20 months
- d) 3-6 months
- e) 3 years

137 Fodder processing room, pumping station, mixing tanks are facilities for the following pig feeding system:

- a) wet and dry feeding system
- b) dry feeding system
- c) organic feeding system
- d) grazing
- e) liquid feeding system

138 For hens in battery cages the access to fodder is done beneath a limiter (adjusting plate) placed in the trough until the age of:

- a) 5 days
- b) 40 days
- c) 10 weeks
- d) 40 weeks
- e) 18-20 weeks

139 Choosing the animals and groups formation are:

- a) animal stockmanship actions before transport
- b) veterinary activities for preparing animals for transport
- c) administrative and organizational actions before transport
- d) administrative procedures during the transport
- e) monitoring actions during the transport

140 Which is the validity period of the tickets confirming the ownership of animals for cattle and horses?

- a) 60 days
- b) 5 years
- c) 15 days
- d) 3 months

- e) 1 year
- 141 For animal in household units, the ticket confirming the ownership of animals is signed and issued by:**
 - a) the farm manager
 - b) the mayor office
 - c) territorial sanitary veterinary agencies
 - d) the national sanitary veterinary authority
 - e) the environment ministry
- 142 Which is the validity period of the veterinary health certificates for live animal transportation?**
 - a) no more than 10 days from the day they were issued
 - b) until the animals reach their final destination
 - c) no more than 30 days from the day they were issued
 - d) no more than 48 hours from the moment they were issued
 - e) no more than 1 year
- 143 Which transporter authorization is valid for all journeys (shorter or longer than 8 hours):**
 - a) type 1
 - b) type 2
 - c) type 3
 - d) none
 - e) type 300
- 144 Which statement is NOT correct for vehicles used for long journeys:**
 - a) must have an adequate ventilation system capable of operating for at least 4 hours, independently of the vehicle engine
 - b) must have a temperature monitoring and recording system
 - c) must have a Navigation System (GPS)
 - d) must have water tanks' total capacity at least equal to 18 % of vehicle load
 - e) must have a warning system to alert the driver if the temperatures inside de vehicle are outside the limits
- 145 Which document must have the animals' transporters for long journeys (taking more than 8 hours), an extensive document with 5 sections:**
 - a) journey log
 - b) certificate of approval of means of transport
 - c) certificate of competence for drivers and attendants
 - d) transporter authorization
 - e) veterinary health certificate
- 146 CANNOT be transported by car on a route of more than 100 km:**
 - a) cats of ten weeks of age
 - b) calves of one month of age
 - c) pregnant females for whom 50 % of the expected gestation period has already passed
 - d) lambs of less than one week
 - e) cervine animals outside the velvet period
- 147 In which animals the loading/unloading ramps must have slopes not steeper than an angle of 26 degrees 34 minutes (50%):**
 - a) calves
 - b) horses
 - c) pigs

- d) sheep
- e) porpoises

148 In animal transportation, when loading into vehicles is done during the night, appropriate lighting shall be provided with an intensity (measured at 1 m height) of at least:

- a) 2000 lux
- b) 10 lux
- c) 50 lux
- d) 500 lux
- e) 1120 lux

149 For ruminants during transportation, the milking is done at least at:

- a) 6 hours
- b) 12 hours
- c) the ruminants are not milked during the transportation
- d) 24 hours
- e) 8 hours

150 To prevent animal slipping, stationary or mobile ramps used for animal loading into railway cars have rectangular foot battens at each:

- a) 4.5 cm
- b) 25 cm
- c) 2.5 cm
- d) 1.5 cm
- e) 3 cm