**LIVESTOCK PRODUCTS TECHNOLOGY:**

**CHAPTER 12: WOOL SCIENCE AND TECHNOLOGY**

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1.Wool is

 a. Natural fibre

 b. Animal origin

 c. Hygroscopic

 d. All of the above

 2. Structurally the wool is devoid of ---------------

 a. Cortex

 b. Medulla

 c. Cuticle

 d. None

 3. The long chains of keratin in wool lie ----------- to long axis of the fiber.

 a. Parallel

 b. Perpendicular

 c. At an angle of 60 degrees

 d. All of the above

 4. The long keratin molecules in wool are linked together with

 a. Cysteine links

 b. Ionic links

 c. Hydrogen bonds

 d. All of the above

5.Wool can

a. Transmit UV rays.

b. Be felted or matted easily

c. Both

d. None

6.The length of wool fibre

a. Is expressed in centimetres

b. Determines spinnability of fibre

c. Length of fibre in straightened condition

d. All of the above

7. The amount of vegetable content present in a fleece is known as

a. Scouring yield

b. Burr content

c. Crimp

d. All of the above

8. The process of cleaning of wool is called

a. Scouring

b. Carbonization

c. Burring

d. Shearing

9.The process of removing burr from wool is known as

a. Burring

b. Shearing

c. Carbonization

d. Shearing

10. During embryonic development, the follicles appear in the ------------- month of gestation.

a. First

b. Second

c. Third

d. None

11. The most crucial layer in the process of wool formation is

a. Basal layer of epidermis

b. Basal layer of endoderm

c. Basal Layer of dermis

d. None

12. Each trio in the formation of primary follicles consists of

a. Sebaceous gland

b. Sweat gland

c. Arrector muscle

d. All of the above

13.The process of clipping of wool from sheep is known as

a. Shearing

b. Ringing

c. Shaving

d. Cutting

14. The wrinkles from wool are removed by

a. Burring

b. Carbonization

c. Breaming

d. Ringing

15. The following organizations have standard testing procedures for wool

a. Indian Standard Association

b. International Wollen Textile Organization

c. British Standards

d. All of the above

16. Match the following:

A) Lock 1. Coarse, brittle wool fibre

B) Kemp 2. Group of fibres clinging together

C) Keratin 3. Natural waviness of wool fibre

D) Crimp 4. Wool protein

a. A)-2, B)-1, C)-4, D)-3

b. A)-1, B)-2, C)-3, D)-4

c. A)-2, B)-3, C)-4, D)-1

d. A)-4, B)-3, C)-2, D)-1

17. Suint is

a. Secretion of sudoriferous glands

b. Alkaline in nature

c. Potassium rich

d. All of the above

18. Secretions of sebaceous glands of the skin

a. Lanolin

b.Wool wax

c. Both

d. None

19. Process of removal of wool fibres from sheep skin through use of chemicals

a. Fellmongering

b. Sweating

c. Carbonization

d. Scouring

20. Plucking of fleece of indigenous sheep having double coat and loosening of the fibre

a. Rooing

b. Felting

c. Burring

d. Scouring

21. Removal of objectionable parts from the body of fleece after shearing is

a. Skirting

b. Count

c. Warp

d. Hank

22. The unit for measurement of length of yarn

a. Lea

b. Hank

c. Both

d. None

23. Handle is a measure of

a. Fineness

b. Length

c. Diameter

d. Both a. & c.

24. Chemicals used for fellomongering

a. Sodium sulphide

b. Arsenic

c. Thallium

d. Both a. & c.

25. Index of thickness of yarn is --------

a. Handle

b. Hank

c. Count

d. Warp

26. The following statements are correct about Mohair

A. Obtained from Angoora goats

B. Diameter of 60 microns

C. Scales not fully developed

D. Resilient and Durable

a. A,B,C,D

b. A,C,D

c. A,B,D

d. None

27. The following statements are incorrect about fur

A. Synonym of non-human hair

B. Also known as pelage

C. Structurally similar to hair

D. Consists of Cuticle, cortex and medulla

a. A,B,C,D

b. A,C,D

c. A,B,D

d. None

28. The wool fibre contains this amino acid consisting of sulphur.

a. Methionine

b. Cysteine

c. Lysine

d. Taurine

29. The cuticular patterns present in wool fibre

a. Coronal

b. Corona-Reticulate

c. Reticulate

d. All of the above

30. Wool gives up moisture when heated up to a temperature of ---------°C.

a. 100-150

b. 200-250

c. 300

d. None

31. The keratin in wool decomposes to ammonia at a temperature of\_\_\_\_\_°C .

a. 50

b. 100

c.130

d. None

32. The specific gravity of wool is

a. 1.204

b. 1.304

c. 1.404

d. 1.509

33. The burr content of wool is estimated by dissolving wool in ---------- solution.

a. Sodium sulphide

b. Zinc

c. Sodium hydroxide

d. Iodine

34. The composition of Nitrogen in dry wool is

a. 50-52%

b. 16-17%

c. 22-25%

d. 3-4%

35. Each cortical cell is composed of ------------ macrofibrils at the widest point

a. 40-50

b. 5-20

c.1-2

d. 3-4

36. The macrofibrils are composed of bundles of -------------- microfibrils.

a. 200-300

b. 500-800

C. 400

d. 1000

37. Ageing of wool is used for

a. Setting

b. Stress relaxation

c. Extension

d. Both a. & c.

38. The colour of wool is

a. Brown

b. White

c. Yellow

d. All of the above

39. Dark fibre contamination is a common problem in

a. Merino wools

b. Down

c. Both

d. None

40. The material recovered from woolscouring liquors is

a. Woolwax

b. Woolgrease

c. Lea

d. Wax

41. Exposure of wool to 254nm UV light in regular conditions results in the wool’s visual transformation.

a. Blue

b. Orange

c. Yellow

d. Green

42. For optimal bonding with wool, the dye molecule needs to exhibit a strong affinity.

a. Hydrophobic structure

b. Hydrophillic structure

c. Amphoteric structure

d. None of the above

43. Sulphitolysis of wool holds significant industrial importance in operations like:

a. Establishing yarn and fabric properties

b. Gentle bleaching techniques

c. Subsequent treatments after oxidative shrinkproofing.

d. All of the above

44.------------ marks the initial phase in the mechanical processing of cleaned wool.

a. Setting

b. Lumping

c. Carding

d. Knitting

45.------------- facilitates the production of finer, stronger, more consistent, and less fuzzy yarns.

a. Combing

b. Rubbing

c. Shearing

d. Gilling

46. The process of treating wool silvers in aqueous detergent solution for removal of unwanted impurities is

a. Recombing

b. Combing

c. Backwashing

d. Gilling

47.The ring frame generates approximately -------- times the output per spindle compared to mule frame spinning.

a. 2.5

b. 3.5

c. 4.5

d. 5.5

48.Plying of yarn is

a. Spinning

b. Twisting

c. Setting

d. Rolling

49. Commonly used products for insect proofing the wool are:

a. Sulcoferon

b. Permethrin

c. Cyfluthrin

d. All of the above

50. The natural dyes of plant origin used for dyeing of wool are obtained from:

a. Indigo

b. Saffron crocus

c. Oak apples

d. All of the above

51. The only dye of animal origin used for dyeing of wool is.

a. Cochineal

b. Reddisine

c. Carotene

d. Lubroscene

52. ---------- plays a crucial role in achieving the final texture of refined wool.

a. Relaxing

b. Pressing

c. Decasting

d. Pressing

53. The outermost protective layer of scales in wool is

a. Cortex

b. Cuticle

c. Matrix

d.Corona

54.The long keratin molecules in wool are not linked by

a. Cysteine links

b. Hydrogen bonds

c. Ionic links

d. Vanderwall bonds

55. Wool absorbs ---------- of its own weight.

a. 18-50%

b. 10%

c. 5-10%

d. 60%

56. The range of refractive index of wool

a. 1.234-4.677

b. 1.304-1.553

c. 1.553-5.00

d. 1.433-4.00

57. Wool can be destructed completely when boiled with ------- solution of caustic soda.

a. 5%

b. 10%

c. 2%

d. 56%

58. The volume occupied by medulla in a fibre

a. Scouring Percentage

b. Medullation Percentage

c. Burr Percentage

d. None

59. The ideal temperature for scouring of wool is----------- °C.

a. 45

b. 50

c. 20

d. 5

60. The wool colour turns light yellow followed by treatment with

a. Sulphuric acid

b. Benzoic acid

c. Nitric acid

d. Hippuric acid

61. Smallest part of the wool fiber

a. Macro fibrils

b. Micro fibrils

c. Helical coil

d. Matrix

62. ------------ is the process of removal of wool by bacterial digestion.

a. Shunting

b. Shimmering

c. Sweating

d. Soaking

63. The ability of textile to undergo irreversible increase in bulk density

a. Knitting

b. Setting

c. Felting

d. None

64. ----------- is the longitudinal section of fabrics arranged in a sheety form

a. Warp

b. Barp

c. Burr

d. Grease

65. The process in which two series of threads are used to produce a fabric running longitudinally and the other lattidinaly is

a. Shearing

b. Shaving

c. Weaving

d. Gilling

66. A subjective assessment of diameter of hair with respect to its tactile qualities is

a. Handle

b. Hank

c. Lea

d. Scale

67. The artificial moult in sheep after chemical application is seen within

a. 1-3 days

b. 1 week

c. 10-16 days

d. 1 month

68. Wool wax with suint is known as

a. Wool wax

b. Wool grease

c. Wool yolk

d. None

69. Coarse brittle wool fibre having irregular medulla

a. Fleece

b. Kemp

c. Crimp

d. Lock

70. The length of wool fibre without disturbing its natural waviness is

a. Fibre length

b. Staple length

c. Fleece length

d. None

71. The length of fibre in streched condition is

a. Fibre length

b. Staple length

c. Fleece length

d. None

72. Suint is

a. Water soluble

b. Water insoluble

c. Both

d. None

73. Lea is -------- of Hank.

a. 1/8 th

b. 1/7 th

c. 1/10 yh

d. None

74. The following are the systems of wool grading

a. ISI system of wool grading

b. The English system of wool grading

c. The American blood system of wool grading

d. All of the above

75. The cuticle of wool on dissection consists of

a. Epicuticle

b. Exocuticle

c. Endocuticle

d. All of the above

76. The types of corticular cells in a wool

a. Orthocuticular cells

b. Paracuticular cells

c. Hexacuticular cells

d. Both a. & b.

77. The ---------------- contains proteins and waxy lipids and runs through the whole fibre length.

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

78. The ---------- is responsible to make the wool fire resistant .

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

79. The antistatic property of wool comes from

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

80. The basic supporting system of the wool fibres is

a. Macrofibrils

b. Microfibrils

c. Matrix

d. All of the above

81. The rotation of the hellical coil in wool is

a. Right handed

b. Left handed

c. Perpendicular

d. Parallel

82. The outer root sheath of bulb forms

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

83. The inner root sheath of bulb forms

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

84. The -------- follicle forms the trio.

a. Primary

b. Secondary

c. Tertiary

d. None

85. The --------- follicles lack arrector muscles.

a. Primary

b. Secondary

c. Tertiary

d. None

86. About 90% of the wool fibre is constituted of

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

87. Wool can strech upto ------ % of it’s natural dimension in length.

a. 30

b. 40

c. 50

d. 60

88. No harm occurs to wool on exposure to

A. Acids

b. Alkalis

c. Both

d. None

89. The chemical nature of wool is due to

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

90. 5% of the wool fibre consists of

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

91. The ------- layer makes wool shower proof.

a. Cortex

b. Medulla

c. Cell membrane complex

d. Cuticle

92. In case of merino wool, the cortical cells are arranged

a. Unilaterally

b. Bilaterally

c. Irregularly

d. None

93. The secondary: primary follicle ratio in fine wool is

a. 21:1

b. 3:1

c. 7:1

d.11:1

94. The secondary: primary follicle ratio in carpet wool is

a. 21:1

b. 3:1

c. 7:1

d.11:1

95. The factor which indicates regularity of the yarn is known as

a. Coefficient of variation

b. Frictional coefficient

c. Abstract coefficient

d. None

96. The following are the methods of shearing

a. Along the sheep

b. Around the sheep

c. Opening of the fleece

d. All of the above

97. The carpet wool has ------- % of medullated fibres.

a. 20

b. 25

c. 40

d. 50

98. The classification of wool is based on the proportion of Merino ancestry present in the sheep.

a. ISI system of wool grading

b. The English system of wool grading

c. The American blood system of wool grading

d. All of the above

99. The ------------- relies on the quantity of yarn Hanks that can be produced from a pound of clean wool.

a. ISI system of wool grading

b. The English system of wool grading

c. The American blood system of wool grading

d. All of the above

100. The fibre diameter in micron for superfine wool is

a. <25

b.100

c. 200

d. >50

**ANSWER KEY:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  1.(d) |  2. (b) |  3. (a) |  4. (d) |  5. (c) |
|  6. (d) |  7. (b) |  8. (a) |  9. (c) |  10. (b) |
|  11. (a) |  12. (d) |  13. (a) |  14. (c) |  15. (d) |
|  16. (d) |  17. (d) |  18. (c) |  19. (a) |  20. (a) |
|  21. (a) |  22. (c) |  23. (d) |  24. (a) |  25. (a) |
|  26. (b) |  27. (d) |  28. (b) |  29. (d) |  30. (a) |
|  31. (c) |  32. (b) |  33. (c) |  34. (b) |  35. (b) |
|  36. (b) |  37. (b) |  38. (d) |  39. (c) |  40. (b) |
|  41. (a) |  42. (a) |  43. (d) |  44. (c) |  45. (a) |
|  46. (c) |  47. (a) |  48. (b) |  49. (a) |  50. (d) |
|  51. (a) |  52. (c) |  53. (a) |  54. (d) |  55. (a) |
|  56. (b) |  57. (a) |  58. (b) |  59. (a) |  60. (c) |
|  61. (c) |  62. (c) |  63. (c) |  64. (a) |  65. (c) |
|  66. (a) |  67. (c) |  68. (c) |  69. (b) |  70. (b) |
|  71. (a) |  72. (a) |  73. (b) |  74. (d) |  75. (d) |
|  76. (d) |  77. (c) |  78. (b) |  79. (b) |  80. (b) |
|  81. (a) |  82. (d) |  83. (a) |  84. (a) |  85. (b) |
|  86. (a) |  87. (a) |  88. (a) |  89. (a) |  90. (c) |
|  91. (d) |  92. (b) |  93. (a) |  94. (b) |  95. (a) |
|  96. (d) |  97. (d) |  98. (c) |  99. (b) |  100. (a) |