ANIMAL SCIENCE REVIEWER BASED ON TOS (MODULE E: SLAUGHTERING, PROCESSING AND MARKETING OF ANIMALS AND THEIR PRODUCTS) BY AGRICULTURE REVIEW

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1. Market hogs scheduled for slaughter are withheld from solid feed for 12 to 24 hours while given continuous access to clean drinking water. Why is water maintained during this fasting period?

a. Water raises muscle glycogen levels above normal physiological limits prior to stunning

b. Water facilitates emptying of the digestive tract to reduce evisceration contamination while preventing carcass dehydration and shrinkage

c. Water softens the outer skin so scalding can be omitted during dressing

d. Water dilutes blood plasma so sticking and bleeding can be delayed after stunning

2. A market hog weighing 90 kilograms live weight is slaughtered and dressed, yielding a chilled carcass weight of 64.8 kilograms. What is the dressing percentage of this hog?

a. 68.0 percent

b. 70.5 percent

c. 72.0 percent

d. 75.0 percent

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3. Immediately after a market hog is rendered unconscious by electrical stunning in an abattoir, sticking must be performed within seconds. What physiological reason makes immediate bleeding essential?

a. Residual cardiac contractions rapidly pump blood out of the vascular system, improving carcass keeping quality and appearance

b. Blood clots inside the aorta within two seconds of electrical stunning if not drained

c. Immediate sticking prevents rigor mortis from ever occurring in skeletal muscle

d. Delaying sticking causes bile from the gallbladder to flow directly into the carotid arteries

4. During hog slaughtering, the scalding tank water temperature inadvertently climbs to 75 degrees Celsius for several minutes before the carcass is lifted for scraping. What dressing defect results from this procedural error?

a. The bristles dissolve completely, leaving the carcass ready for singeing without scraping

b. Subcutaneous backfat liquefies and drains out through the hooves

c. Internal visceral organs freeze against the rib cage, complicating evisceration

d. Hair follicles constrict and cook into the skin, making bristle removal difficult and causing epidermal tearing

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5. Stress-susceptible market hogs subjected to rough loading, overcrowding, and electric prods right before slaughter undergo rapid post-mortem muscle glycolysis while carcass temperature remains elevated. What meat quality defect develops as a result?

a. Dark, firm, and dry pork with abnormally high ultimate pH and minimal drip loss

b. Pale, soft, and exudative pork with low pH, denatured muscle proteins, and poor water-holding capacity

c. Cold-shortened pork with rubbery connective tissue and bright cherry-red color

d. Marbled pork with elevated intramuscular fat deposition and enhanced tenderness

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6. Beef cattle transported for 36 hours without feed or adequate rest arrive exhausted at the slaughterhouse, severely depleting their muscle glycogen reserves before slaughter. How does this condition alter post-mortem carcass quality?

a. Lactic acid accumulates excessively, driving muscle pH below 5.0 and bleaching the meat

b. Muscle fibers lose all water-holding capacity and release heavy exudate during chilling

c. Limited lactic acid formation keeps ultimate muscle pH high, producing dark, firm, and dry beef prone to rapid bacterial spoilage

d. Rigor mortis accelerates within five minutes of bleeding while improving shelf life

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7. A freshly dressed beef carcass is moved directly into a high-velocity blast chiller that drops internal muscle temperature below 10 degrees Celsius before the onset of rigor mortis. How does this chilling practice affect meat tenderness?

a. Severe irreversible sarcomere contraction occurs, resulting in markedly tougher meat even after cooking

b. Proteolytic enzymes activate twice as fast, producing tender meat within two hours

c. Intramuscular fat crystallizes into fine marbling streaks that improve juiciness

d. Muscle pH stabilizes at 7.0, preventing any structural shortening of myofibrils

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8. During ante-mortem inspection at a municipal abattoir, a veterinary inspector observes a steer with high fever, labored breathing, and mucopurulent nasal discharge. What is the proper regulatory disposition for this animal?

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a. Approve the steer for immediate regular slaughter to prevent weight loss in the holding pen

b. Mix the steer with healthy cattle on the kill floor and trim only the lungs during post-mortem inspection

c. Administer broad-spectrum antibiotics and slaughter the steer two hours later

d. Segregate the steer as a suspect animal in an isolation pen for detailed clinical evaluation and delayed slaughter or condemnation

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9. While eviscerating a suspended cattle carcass, why does a skilled butcher carefully tie off both the esophagus and the rectum before detaching the digestive tract?

a. To increase internal gas pressure so the intestines slide out faster

b. To prevent leakage of ruminal contents and fecal matter onto exposed carcass surfaces, minimizing microbial contamination

c. To retain digestive enzymes inside the carcass for post-mortem tenderization

d. To preserve blood volume inside the mesenteric veins for higher carcass yield

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10. A meat fabricator is breaking down chilled pork sides into standard primal cuts to supply a processor specializing in cured, sliced bacon. Which wholesale cut must be separated from the lower middle section of the carcass?

a. Picnic shoulder

b. Boston butt

c. Belly

d. Ham

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11. A steakhouse chef requests a wholesale beef cut taken from the rear back region that is naturally tender due to minimal locomotor activity and well suited for dry-heat grilling. Which primal cut satisfies this specification?

a. Short loin

b. Fore shank

c. Brisket

d. Chuck

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12. A commercial meat processor holds vacuum-packaged beef ribeye subprimals at 1 to 2 degrees Celsius for 21 days before portioning them into steaks. Which biochemical mechanism improves meat tenderness during this conditioning period?

a. Conversion of bone marrow calcium into intramuscular fat droplets

b. Complete evaporation of free water from the sarcoplasm

c. Anaerobic fermentation of muscle glycogen into ethanol and carbon dioxide

d. Gradual degradation of structural myofibrillar proteins by endogenous proteolytic enzymes such as calpains

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13. A dressed broiler chicken weighs 1.44 kilograms after bleeding, scalding, defeathering, and evisceration. If the flock averages a dressing percentage of 72 percent, what was the bird's live weight prior to slaughter?

a. 1.80 kilograms

b. 2.00 kilograms

c. 2.16 kilograms

d. 1.92 kilograms

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14. When comparing the proximate chemical composition of lean pork tenderloin against heavily marbled pork belly, how does increasing fat deposition affect moisture content in meat?

a. Moisture percentage rises proportionally with fat percentage to maintain cellular turgor

b. Moisture percentage remains strictly fixed at 75 percent regardless of carcass fatness

c. Moisture percentage decreases inversely as fat percentage increases

d. Protein percentage doubles as fat displaces water inside the adipocytes

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15. A freshly cut beef steak appears purplish-red immediately after slicing, blooms to a bright cherry-red after 30 minutes in air, and turns brownish-gray after four days of retail display. Which sequence of myoglobin pigment states explains these visual changes?

a. Deoxymyoglobin oxygenates to oxymyoglobin and subsequently oxidizes to metmyoglobin

b. Metmyoglobin reduces to oxymyoglobin and subsequently converts to hemoglobin

c. Oxymyoglobin dehydrates to deoxymyoglobin and subsequently turns into melanin

d. Hemoglobin oxidizes to nitrosomyoglobin and subsequently bleaches to myoglobin

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16. Meat cut from the shank of an eight-year-old draft carabao remains noticeably tougher than loin meat from a young steer even after identical dry-heat roasting. Which structural component primarily accounts for this toughness?

a. Excessive sarcoplasmic myoglobin crystals embedded between muscle bundles

b. Higher concentration of water-soluble elastin that hardens upon heating

c. Absence of actin and myosin filaments in older working animals

d. Greater abundance of mature, heat-stable cross-linked collagen in heavily exercised muscles

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17. When comparing first-day bovine colostrum to normal mature cow's milk collected 30 days post-calving, how do their chemical composition and functional value differ?

a. Colostrum contains higher lactose and water but virtually zero protein

b. Colostrum contains markedly higher immunoglobulins, total solids, protein, and fat, but lower lactose

c. Mature milk contains five times more antibodies and minerals than colostrum

d. Both colostrum and mature milk have identical solids-not-fat and casein-to-whey ratios

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18. A local dairy processor producing traditional soft white cheese and milk pastillas consistently obtains a substantially higher finished product yield per liter from carabao's milk than from Holstein cow's milk. Which compositional factor explains this difference?

a. Carabao's milk contains more dissolved water and less lactose than Holstein cow's milk

b. Holstein cow's milk lacks casein micelles needed for curd formation

c. Carabao's milk has significantly higher butterfat, protein, and total solids concentrations

d. Carabao's milk has a higher concentration of beta-carotene that binds extra moisture

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19. A food processor separates whole chicken eggs into yolk and albumen to manufacture an emulsified mayonnaise dressing. Why is the yolk fraction indispensable for this application rather than the albumen?

a. Almost all of the egg's lipids, emulsifying phospholipids such as lecithin, and fat-soluble vitamins reside in the yolk, whereas albumen is predominantly water and protein

b. The yolk contains 90 percent water and high concentrations of foaming ovalbumin

c. Albumen contains excessive cholesterol that breaks oil-in-water emulsions

d. Calcium carbonate in the yolk acts as the sole stabilizing surfactant

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20. At a dairy receiving station, a technician mixes equal volumes of raw cow's milk and 68 percent ethyl alcohol in a test tube and observes immediate fine curdling along the glass wall. What does this result indicate about the milk?

a. The milk has unusually high butterfat suitable for premium butter churning

b. The milk was properly pasteurized prior to farm delivery

c. The milk contains added cane sugar that increases its specific gravity

d. Developed acidity or mineral imbalance has destabilized casein micelles, making the milk prone to curdling during heat processing

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21. Normal whole cow's milk exhibits a specific gravity between 1.028 and 1.032 at 15.5 degrees Celsius. A morning farm delivery yields a lactometer specific gravity reading of 1.020 accompanied by an abnormally low butterfat test. Which adulteration practice is most strongly indicated?

a. Skimming of cream without adding any liquid

b. Dilution of the milk with added water

c. Addition of starch or skim milk powder to thicken the milk

d. Mixing of carabao's milk into cow's milk

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22. Two raw milk deliveries undergo the methylene blue reduction test at 37 degrees Celsius. Sample A turns completely white within 40 minutes while Sample B retains its blue color for more than six hours. How should the dairy plant evaluate these two batches?

a. Sample A is superior because rapid decolorization indicates high vitamin concentration

b. Sample B is heavily contaminated with psychrotrophic molds that fix the dye

c. Sample A carries a high bacterial load that rapidly depletes dissolved oxygen, whereas Sample B has low microbial contamination and better keeping quality

d. Both samples have identical bacterial counts, and the difference reflects butterfat percentage alone

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23. Immediately after continuous pasteurization of fluid milk, a quality control analyst conducts the alkaline phosphatase test and records a positive result. What operational issue does this test reveal?

a. Pasteurization temperature or holding time was insufficient, or raw unpasteurized milk leaked into the pasteurized batch

b. The milk was overheated beyond sterilization temperatures, caramelizing lactose

c. Homogenization pressure was set too high, fracturing the casein micelles

d. The herd was fed excessive dietary phosphorus prior to milking

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24. When newly laid eggs and three-week-old eggs stored at warm room temperature are submerged in a 10 percent saline solution, the fresh eggs sink to the bottom while the older eggs float. Which physical change causes the older eggs to become buoyant?

a. Shell thickness doubles during storage as calcium migrates outward

b. Egg yolk converts into dense solid lipid crystals that trap gas

c. Albumen absorbs atmospheric moisture through the shell, expanding total egg weight

d. Evaporation of water through shell pores enlarges the air cell and lowers the egg's specific gravity

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25. During breakout quality inspection, two 60-gram chicken eggs are cracked onto a level glass plate. Egg X displays a thick albumen height of 8.5 millimeters whereas Egg Y spreads flat with a height of 3.2 millimeters. How do these eggs compare in internal quality?

a. Egg Y has a higher Haugh unit score because thinner albumen indicates superior whipping volume

b. Egg X has a much higher Haugh unit score, reflecting fresher albumen structure and superior table grade

c. Both eggs receive the exact same Haugh unit score because their shell weights are identical

d. Egg Y is fresher because thick albumen normally thickens further as eggs age

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26. A meat processor formulates cured ham and native sausages using salt, sugar, and sodium nitrite. Beyond stabilizing the characteristic pinkish-red cured color, what is the most vital food safety role of sodium nitrite?

a. Eliminating all aerobic surface molds during ambient drying

b. Neutralizing heavy metal residues absorbed from animal feed

c. Inhibiting the germination, outgrowth, and neurotoxin production of Clostridium botulinum spores

d. Hydrolyzing tough collagen fibers into soluble gelatin during refrigeration

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27. During commercial ham curing, food-grade alkaline polyphosphates are dissolved in the pumping brine before meat tumbling. How do polyphosphates improve the processing performance of cured meat?

a. They raise muscle pH and enhance water-holding capacity, minimizing cooking shrinkage and improving juiciness and slicing yield

b. They acidify the meat below pH 4.5 to accelerate moisture evaporation during smoking

c. They replace sodium chloride completely so salt-free cured hams can be stored unrefrigerated

d. They oxidize myoglobin rapidly to give the ham a dark brown roasted crust

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28. While comminuting a frankfurter meat emulsion in a bowl chopper, an operator neglects to add sufficient flaked ice, allowing the batter temperature to rise to 22 degrees Celsius before stuffing. What defect typically appears after thermal cooking?

a. The sausage casing dissolves completely into the cooking water

b. Salt precipitates out as white crystals inside the lean meat matrix

c. Muscle proteins swell excessively, causing the frankfurters to double in diameter

d. Fat melts and separates from the denatured protein matrix, producing emulsion breakdown with fat caps and jelly pockets

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29. Pork loin chops stored for four months at minus 18 degrees Celsius inside loosely folded, moisture-permeable wax paper develop dry, tough, grayish-brown surface patches. What physical mechanism caused this quality loss?

a. Growth of thermophilic bacteria across the frozen meat surface

b. Sublimation of ice crystals from the meat surface directly into water vapor due to poor moisture-barrier packaging

c. Enzymatic browning triggered by excess dietary vitamin E in the hog ration

d. Absorption of ambient freezer humidity into the lean muscle fibers

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30. Ground pork develops stale, rancid off-odors considerably faster during frozen storage than ground beef packaged and stored under the exact same conditions. Which compositional difference explains pork's higher susceptibility to oxidative deterioration?

a. Pork contains double the iron concentration of beef, which halts lipid breakdown

b. Beef fat consists predominantly of short-chain volatile fatty acids that evaporate during freezing

c. Pork lipid contains a higher proportion of polyunsaturated fatty acids that oxidize more readily upon exposure to oxygen

d. Pork lacks structural collagen to shield muscle cells from freezer light

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31. A dairy processing plant employs continuous high-temperature short-time pasteurization to destroy milk-borne pathogens such as Coxiella burnetii and Mycobacterium tuberculosis while preserving fresh flavor. Which minimum time-and-temperature regime meets this standard?

a. Heating milk to at least 72 degrees Celsius for 15 seconds followed by rapid cooling to 4 degrees Celsius or below

b. Heating milk to 55 degrees Celsius for 10 minutes followed by slow ambient cooling

c. Heating milk to 63 degrees Celsius for 15 seconds followed by holding at 25 degrees Celsius

d. Boiling milk at 100 degrees Celsius for 30 minutes before bottling

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32. After pasteurization, fluid market milk is pumped through a narrow homogenizing valve under high pressure. What physical change does homogenization produce in the finished milk?

a. Removes all lactose crystals so lactose-intolerant consumers can digest the milk

b. Sterilizes bacterial spores so the milk requires no refrigeration for six months

c. Precipitates whey proteins to increase the clarity of the milk

d. Reduces milk fat globules to uniformly tiny sizes so they remain dispersed and do not rise to form a cream layer

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33. In manufacturing traditional soft white cheese, a dairy processor adds liquid rennet to warm milk at 38 degrees Celsius to form a firm elastic curd. Which specific milk protein fraction is cleaved by chymosin in rennet to initiate coagulation?

a. Beta-lactoglobulin

b. Kappa-casein

c. Alpha-lactalbumin

d. Serum albumin

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34. Pasteurized milk bottled in clear transparent containers and displayed beneath bright fluorescent supermarket lights develops a cardboard-like or burnt-feather off-flavor within 24 hours even at 3 degrees Celsius. What biochemical reaction causes this defect?

a. Lactic acid fermentation by surviving thermoduric streptococci

b. Hydrolysis of lactose into galactose by residual alkaline phosphatase

c. Photo-oxidation of riboflavin and sulfur-containing amino acids such as methionine induced by light exposure

d. Absorption of refrigerant fumes through the sealed plastic cap

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35. A commercial poultry packing station washes dirty table eggs prior to grading and cartoning. Why must the wash water temperature be kept at least 11 degrees Celsius warmer than the internal temperature of the eggs?

a. Warm water causes slight expansion of egg contents, preventing negative pressure from drawing wash water and bacteria inward through shell pores

b. Cold water dissolves the calcium carbonate shell within thirty seconds of contact

c. Warm water partially cooks the outer albumen into an impermeable antimicrobial seal

d. Warm water shrinks the air cell so the eggs appear heavier on grading scales

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36. To maintain internal quality in table eggs shipped to distant provincial markets without cold storage, a farm sprays clean eggshells with a thin film of food-grade mineral oil shortly after collection. How does shell oiling retard egg deterioration?

a. Mineral oil penetrates the yolk membrane to sterilize Salmonella bacteria

b. Mineral oil adds calcium to strengthen hairline cracks in the shell

c. Mineral oil accelerates carbon dioxide release so the albumen stays acidic

d. Mineral oil seals shell pores, restricting carbon dioxide escape and moisture evaporation so albumen remains thick

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37. When fresh chicken eggs are held for two weeks at warm tropical ambient temperatures, the thick albumen steadily thins out and the yolk flattens when broken. What internal chemical shift triggers this thinning?

a. Conversion of yolk cholesterol into lactic acid, which drops albumen pH below 5.0

b. Escape of dissolved carbon dioxide through shell pores raises albumen pH, weakening the ovomucin-lysozyme complex

c. Absorption of atmospheric nitrogen coagulates the chalazae into liquid water

d. Oxidation of shell cuticle pigments dissolves the vitelline membrane

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38. During the curing of salted duck eggs in saturated brine or salted clay paste for 14 to 18 days, salt diffuses inward through the shell pores. Aside from imparting salty taste, how does this high salt concentration preserve the egg and modify yolk texture?

a. Converts albumen proteins into insoluble calcium crystals while liquefying the yolk

b. Raises internal water activity to encourage beneficial lactic acid bacteria

c. Reduces water activity to inhibit microbial spoilage while dehydrating yolk proteins into a firm texture and releasing free yolk oil

d. Eliminates all yolk lipids through osmotic diffusion out of the shell

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39. Smallholder cattle raisers bring their fattened steers to a municipal livestock auction market equipped with calibrated weighing scales and open competitive bidding instead of selling individually to roving farmgate traders. What primary marketing advantage does this channel offer producers?

a. Transparent price discovery based on actual live weight and competition among multiple buyers, reducing price asymmetry

b. Complete elimination of all transport costs and municipal market fees

c. Guaranteed government purchase of every unsold animal at retail beef prices

d. Automatic conversion of live steers into vacuum-packed retail cuts at no charge

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40. A backyard hog raiser sells a 95-kilogram market pig to a village buyer who estimates weight visually and pays a flat lump sum per head. Why does this eyeball pricing method generally disadvantage the producer compared to weighed liveweight or carcass-grade pricing?

a. Visual estimation always overpays for high-fat hogs while penalizing heavy animals

b. Weighed liveweight sales prohibit farmers from negotiating price per kilogram

c. Carcass-grade pricing ignores dressing percentage and backfat thickness completely

d. Visual estimation systematically underestimates true animal weight and fails to reward superior lean meat yield or dressing percentage

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41. A poultry grower signs a contract growing agreement with an integrated agribusiness firm that supplies day-old chicks, feeds, vaccines, and technical supervision while paying a fixed base fee plus efficiency bonuses per harvested broiler. Which major marketing risk is shifted from the grower to the integrator?

a. Daily labor management and poultry house sanitation

b. Volatility in live broiler market prices and commercial feed input costs

c. Maintenance of local water supply and electricity inside the broiler house

d. Biosecurity enforcement against visitors entering the farm gate

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42. In remote upland municipalities where backyard raisers market only one or two goats each season, livestock assemblers purchase animals from scattered farms, consolidate full truckloads, and ship them to urban terminal markets. Which marketing function justifies their role despite widening the farm-to-retail price spread?

a. Eliminating the need for veterinary inspection at urban slaughterhouses

b. Setting retail meat prices below farmgate live animal prices

c. Aggregating small dispersed lots into economical transport loads and bridging spatial gaps between rural producers and urban demand

d. Manufacturing commercial concentrate feeds from goat hides

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43. A smallholder swine producer sells live hogs at 180 pesos per kilogram live weight. After slaughtering, transport, and retail distribution, the pork cuts sell to consumers at a live-weight equivalent price of 240 pesos per kilogram. What is the farmer's share of the consumer peso?

a. 75.0 percent

b. 60.0 percent

c. 80.0 percent

d. 66.7 percent

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44. A cattle trader purchases a 400-kilogram steer at the farmgate for 60,000 pesos, spends 4,000 pesos on trucking, feed, and market fees, and resells the steer at a city abattoir for 70,000 pesos. What are the trader's gross marketing margin and net profit on this transaction?

a. Gross marketing margin of 6,000 pesos and net profit of 2,000 pesos

b. Gross marketing margin of 14,000 pesos and net profit of 10,000 pesos

c. Gross marketing margin of 10,000 pesos and net profit of 10,000 pesos

d. Gross marketing margin of 10,000 pesos and net profit of 6,000 pesos

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45. A truckload of 20 beef steers averaging 350 kilograms each at farm loading weighs an average of 329 kilograms upon arrival at an urban slaughterhouse after an 18-hour haul in hot weather. What is the percentage of liveweight shrinkage, and how does it impact marketing efficiency?

a. 4.0 percent shrinkage, which lowers transport cost per kilogram delivered

b. 6.0 percent shrinkage, which reduces saleable weight and raises the effective marketing cost per kilogram delivered

c. 8.0 percent shrinkage, which improves carcass dressing percentage proportionally

d. 3.0 percent shrinkage, which has zero financial impact because buyers pay farmgate weight

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46. Open-air wet market meat stalls selling unchilled warm meat suffer rapid bacterial growth and must discount unsold cuts by early afternoon, whereas modern meat shops maintain continuous refrigeration from abattoir to retail display. How does an unbroken cold chain improve marketing efficiency?

a. Eliminates the need for post-mortem meat inspection at slaughterhouses

b. Increases daily moisture evaporation to concentrate meat flavor

c. Extends product shelf life, minimizes physical spoilage losses, and enables flexible inventory storage and wider geographic distribution

d. Raises farmgate liveweight shrinkage during long-distance animal hauling

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47. A commercial layer farm mechanically sorts eggs into jumbo, extra-large, large, medium, and small sizes and candles out cracked shells before supplying supermarkets rather than selling unsorted mixed-size trays. How does grading and standardization strengthen marketing effectiveness?

a. Matches distinct buyer segments with uniform quality, captures price premiums for top grades, and lowers transaction inspection costs

b. Eliminates all feed cost fluctuations for the layer enterprise

c. Increases the average physical weight of every egg produced by the flock

d. Prevents eggshells from losing carbon dioxide during warm storage

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48. Twenty smallholder dairy raisers in a municipality form a cooperative to pool their daily milk harvest, operate a shared bulk chilling tank, and negotiate supply contracts directly with a city dairy processor. How does collective marketing enhance their efficiency compared to selling individually?

a. Eliminates the biological need for pasteurization before retail sale

b. Allows each farmer to sell smaller volumes at higher per-liter transport cost

c. Forces the dairy processor to pay identical prices for spoiled and fresh milk

d. Generates economies of scale in chilling and hauling while strengthening bargaining power for better and more stable farmgate prices

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49. When seasonal oversupply depresses live hog farmgate prices, a swine producers' association diverts part of its harvest into processing and packaging frozen tocino, longganisa, and smoked bacon for retail groceries. Which marketing strategy is the association executing?

a. Distress liquidation of live breeding stock to reduce herd inventory

b. Value addition and product differentiation to extend shelf life, absorb surplus volume, and capture higher retail margins

c. Pure spot-market selling through multiple village assemblers

d. Backward integration into commercial corn and soybean farming

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50. A swine cooperative compares two distribution channels: Channel A delivers chilled carcasses directly to institutional buyers with a 15 percent marketing margin and 2 percent spoilage loss, whereas Channel B moves live hogs through three successive intermediaries with a 38 percent marketing margin and 7 percent combined shrinkage and mortality. Which assessment accurately compares the two channels?

a. Channel B is more efficient because involving more intermediaries guarantees higher producer returns

b. Both channels have identical operational efficiency because they market pork from the same farms

c. Channel A achieves superior operational and pricing efficiency by reducing physical losses and intermediary markups, returning a larger share to producers

d. Channel A is less efficient because chilled carcass distribution eliminates consumer choice

Detailed Answer Key & Explanations (Items 1–50)

Complete solutions and technical rationales for Module E: Slaughtering, Processing and Marketing of Animals and their Products.

No.	Ans	Correct Option & Detailed Rationale
1	b	**Water facilitates emptying of the digestive tract to reduce evisceration contamination while preventing carcass dehydration and shrinkage.** Pre-slaughter feed withdrawal clears gut fill to prevent accidental rupture during evisceration, while continuous water keeps tissues hydrated and eases hide/hair removal.
2	c	**72.0 percent.** Dressing percentage is calculated as (Chilled Carcass Weight ÷ Live Weight) × 100 = (64.8 kg ÷ 90.0 kg) × 100 = 72.0%.
3	a	**Residual cardiac contractions rapidly pump blood out of the vascular system, improving carcass keeping quality and appearance.** Because blood is an ideal medium for microbial proliferation and causes dark discoloration, rapid sticking while the heart still beats ensures thorough exsanguination.
4	d	**Hair follicles constrict and cook into the skin, making bristle removal difficult and causing epidermal tearing.** Proper hog scalding requires 58–62°C; overheating to 75°C causes "setting" of the hair follicles and skin damage during mechanical dehairing.
5	b	**Pale, soft, and exudative (PSE) pork with low pH, denatured muscle proteins, and poor water-holding capacity.** Acute pre-slaughter stress triggers rapid anaerobic glycolysis and lactic acid buildup while muscle temperature is still near 39–40°C, denaturing sarcoplasmic and myofibrillar proteins.
6	c	**Limited lactic acid formation keeps ultimate muscle pH high, producing dark, firm, and dry (DFD) beef prone to rapid bacterial spoilage.** Chronic stress and exhaustion exhaust muscle glycogen prior to slaughter, keeping post-mortem pH above 6.0, which tightly binds water and favors spoilage bacteria.
7	a	**Severe irreversible sarcomere contraction occurs, resulting in markedly tougher meat even after cooking.** Chilling pre-rigor muscle below 10°C while pH is still above 6.0 triggers calcium release from the sarcoplasmic reticulum, causing cold shortening.

No.	Ans	Correct Option & Detailed Rationale
8	d	**Segregate the steer as a suspect animal in an isolation pen for detailed clinical evaluation and delayed slaughter or condemnation.** Animals exhibiting systemic febrile or respiratory signs during ante-mortem inspection must be tagged "Suspect," isolated, and examined thoroughly before slaughter decisions.
9	b	**To prevent leakage of ruminal contents and fecal matter onto exposed carcass surfaces, minimizing microbial contamination.** Tying off (rodding) the esophagus and bagging/tying the bung (rectum) isolates gastrointestinal pathogens such as *Salmonella* and *E. coli* from sterile muscle tissue.
10	c	**Belly.** The pork belly (side) lies along the ventral middle portion of the pork carcass beneath the loin and is cured and smoked to manufacture slab and sliced bacon.
11	a	**Short loin.** Located in the posterior dorsal region behind the rib primal, the short loin contains the minimally exercised *longissimus dorsi* and *psoas major* muscles, yielding tender T-bone, porterhouse, and strip steaks.
12	d	**Gradual degradation of structural myofibrillar proteins by endogenous proteolytic enzymes such as calpains.** During post-mortem aging (conditioning) at 1–2°C, calcium-dependent calpains cleave structural proteins like titin, nebulin, and desmin, weakening Z-disks and tenderizing meat.
13	b	**2.00 kilograms.** Live Weight = Dressed Weight ÷ (Dressing Percentage ÷ 100) = 1.44 kg ÷ 0.72 = 2.00 kg.
14	c	**Moisture percentage decreases inversely as fat percentage increases.** In meat proximate composition, lipid displaces water in tissues; lean muscle averages about 75% moisture, whereas heavily marbled or fatty cuts drop significantly in water percentage.
15	a	**Deoxymyoglobin oxygenates to oxymyoglobin and subsequently oxidizes to metmyoglobin.** Freshly cut anaerobic muscle contains purplish-red deoxymyoglobin (Fe^{2+}), blooms upon oxygen binding into bright cherry-red oxymyoglobin (Fe^{2+}), and eventually oxidizes to brown metmyoglobin (Fe^{3+}).
16	d	**Greater abundance of mature, heat-stable cross-linked collagen in heavily exercised muscles.** As animals age and exercise locomotor muscles like the shank, intramuscular collagen forms heat-resistant covalent cross-links that do not readily gelatinize during dry-heat cooking.
17	b	**Colostrum contains markedly higher immunoglobulins, total solids, protein, and fat, but lower lactose.** First-day colostrum is rich in maternal antibodies (IgG), whey proteins, fat, and minerals essential for passive neonatal immunity, while lower lactose helps prevent osmotic scours.
18	c	**Carabao's milk has significantly higher butterfat, protein, and total solids concentrations.** Carabao's milk averages roughly 7–9% butterfat, 4.5–5.0% protein, and 17–19% total solids compared to ~3.5% fat and ~12% total solids in Holstein milk, generating much higher cheese and pastillas yields.
19	a	**Almost all of the egg's lipids, emulsifying phospholipids such as lecithin, and fat-soluble vitamins reside in the yolk, whereas albumen is predominantly water and protein.** Yolk lecithin and lipoproteins possess amphiphilic structures that stabilize oil-in-water emulsions like mayonnaise.

No.	Ans	Correct Option & Detailed Rationale
20	d	**Developed acidity or mineral imbalance has destabilized casein micelles, making the milk prone to curdling during heat processing.** The 68% alcohol platform test detects heat-unstable milk (e.g., sour milk, colostrum, or mastitis milk) that would coagulate inside pasteurizer heat exchangers.
21	b	**Dilution of the milk with added water.** Because water has a specific gravity of 1.000, adding water lowers both the lactometer reading (below 1.028) and the butterfat percentage proportionally; skimming fat alone raises specific gravity.
22	c	**Sample A carries a high bacterial load that rapidly depletes dissolved oxygen, whereas Sample B has low microbial contamination and better keeping quality.** Actively respiring bacteria consume dissolved oxygen and reduce methylene blue dye to colorless leucomethylene blue; shorter reduction times signify heavier contamination.
23	a	**Pasteurization temperature or holding time was insufficient, or raw unpasteurized milk leaked into the pasteurized batch.** Alkaline phosphatase is a native milk enzyme with slightly greater heat resistance than target milk pathogens; a positive test confirms inadequate pasteurization or post-process raw milk contamination.
24	d	**Evaporation of water through shell pores enlarges the air cell and lowers the egg's specific gravity.** Fresh eggs have a specific gravity near 1.080–1.090 and sink in 10% brine, whereas aged eggs lose moisture, expand their air cells, drop below the brine's specific gravity, and float.
25	b	**Egg X has a much higher Haugh unit score, reflecting fresher albumen structure and superior table grade.** Haugh units adjust thick albumen height for egg weight; tall, firm thick albumen (8.5 mm) corresponds to AA quality, whereas watery spreading albumen (3.2 mm) indicates staleness.
26	c	**Inhibiting the germination, outgrowth, and neurotoxin production of *Clostridium botulinum* spores.** In anaerobic vacuum-packed or smoked cured meats, sodium nitrite is indispensable for preventing botulism while also imparting cured pink color, flavor, and antioxidant protection.
27	a	**They raise muscle pH and enhance water-holding capacity, minimizing cooking shrinkage and improving juiciness and slicing yield.** Alkaline polyphosphates shift muscle pH away from the isoelectric point of actomyosin and cleave cross-bridges, increasing electrostatic repulsion and water retention.
28	d	**Fat melts and separates from the denatured protein matrix, producing emulsion breakdown with fat caps and jelly pockets.** Comminution friction generates heat; without flaked ice to keep chopping temperatures below 12–15°C, salt-soluble myofibrillar proteins denature and lose their ability to encapsulate fat droplets.
29	b	**Sublimation of ice crystals from the meat surface directly into water vapor due to poor moisture-barrier packaging.** Freezer burn occurs when surface moisture sublimes into dry freezer air, leaving desiccated, porous, oxidized muscle tissue that becomes tough and discolored.
30	c	**Pork lipid contains a higher proportion of polyunsaturated fatty acids (PUFAs) that oxidize more readily upon exposure to oxygen.** Monogastric pork fat deposits dietary unsaturated fatty acids directly, making it far more susceptible to lipid autoxidation and rancidity than more saturated ruminant beef tallow.

AGRICULTUREREVIEW

No.	Ans	Correct Option & Detailed Rationale
31	a	**Heating milk to at least 72 degrees Celsius for 15 seconds followed by rapid cooling to 4 degrees Celsius or below.** High-temperature short-time (HTST) pasteurization requires 72°C (161°F) for 15 seconds, calibrated to destroy *Coxiella burnetii*, the most heat-resistant non-spore-forming milk pathogen.
32	d	**Reduces milk fat globules to uniformly tiny sizes so they remain dispersed and do not rise to form a cream layer.** High-pressure homogenization shears fat globules from 3–10 µm down to below 1–2 µm, coating them with casein and whey proteins so creaming is prevented.
33	b	**Kappa-casein.** Chymosin specifically cleaves the Phe105–Met106 peptide bond of stabilizing kappa-casein hairs on the micelle surface, releasing hydrophilic glycomacropeptide and allowing para-kappa-casein micelles to aggregate in the presence of calcium ions.
34	c	**Photo-oxidation of riboflavin and sulfur-containing amino acids such as methionine induced by light exposure.** Fluorescent and UV light excite riboflavin (vitamin B2), generating reactive oxygen species that degrade methionine into methional and oxidize lipids, causing "sunlight" or oxidized off-flavors.
35	a	**Warm water causes slight expansion of egg contents, preventing negative pressure from drawing wash water and bacteria inward through shell pores.** Wash water should be at least 11°C (20°F) warmer than the egg (typically 40–45°C) so positive internal pressure pushes outward rather than sucking bacteria into the egg.
36	d	**Mineral oil seals shell pores, restricting carbon dioxide escape and moisture evaporation so albumen remains thick.** Applying tasteless, odorless food-grade mineral oil blocks shell pores, maintaining internal CO_2 levels, low albumen pH, and small air cell size during non-refrigerated transit.
37	b	**Escape of dissolved carbon dioxide through shell pores raises albumen pH, weakening the ovomucin-lysozyme complex.** Fresh egg white has a pH around 7.6; as CO_2 diffuses out, pH climbs toward 9.0–9.5, dissociating the gel-forming ovomucin-lysozyme network into watery thin albumen.
38	c	**Reduces water activity to inhibit microbial spoilage while dehydrating yolk proteins into a firm texture and releasing free yolk oil.** High NaCl concentration lowers water activity (a_w), draws moisture from the yolk into the albumen, concentrates low-density lipoproteins, and liberates golden yolk oil.
39	a	**Transparent price discovery based on actual live weight and competition among multiple buyers, reducing price asymmetry.** Livestock auction markets centralize supply and demand, use certified scales, and foster competitive bidding so producers receive fair market value.
40	d	**Visual estimation systematically underestimates true animal weight and fails to reward superior lean meat yield or dressing percentage.** "Ojo" or eyeball estimation shifts measurement uncertainty onto the farmer and provides no price premium for superior genetics or carcass muscling.
41	b	**Volatility in live broiler market prices and commercial feed input costs.** Under poultry contract growing, the integrator retains ownership of birds and feed, absorbing market price swings and feed cost risk while the grower earns a predictable fee tied to feed conversion and livability.

No.	Ans	Correct Option & Detailed Rationale
42	c	**Aggregating small dispersed lots into economical transport loads and bridging spatial gaps between rural producers and urban demand.** Assemblers perform vital spatial and bulking functions by collecting scattered smallholder animals into full truckloads that lower per-head hauling costs.
43	a	**75.0 percent.** Farmer's Share = (Farmgate Price ÷ Retail Equivalent Price) × 100 = (180 ÷ 240) × 100 = 75.0%.
44	d	**Gross marketing margin of 10,000 pesos and net profit of 6,000 pesos.** Gross Marketing Margin = Selling Price − Buying Price = 70,000 − 60,000 = 10,000 pesos; Net Profit = Gross Margin − Marketing Costs = 10,000 − 4,000 = 6,000 pesos.
45	b	**6.0 percent shrinkage, which reduces saleable weight and raises the effective marketing cost per kilogram delivered.** Shrinkage = [(350 kg − 329 kg) ÷ 350 kg] × 100 = (21 ÷ 350) × 100 = 6.0%. Fewer kilograms delivered spread fixed transport costs over a smaller saleable volume.
46	c	**Extends product shelf life, minimizes physical spoilage losses, and enables flexible inventory storage and wider geographic distribution.** Continuous refrigeration slows psychrotrophic bacterial growth, eliminating distress price discounting and increasing operational marketing efficiency.
47	a	**Matches distinct buyer segments with uniform quality, captures price premiums for top grades, and lowers transaction inspection costs.** Standardization enables buying by description without inspecting individual units, reducing transaction friction and rewarding higher quality grades.
48	d	**Generates economies of scale in chilling and hauling while strengthening bargaining power for better and more stable farmgate prices.** Cooperative milk pooling lowers per-liter cooling and transport expenses and turns fragmented smallholders into a reliable bulk supplier.
49	b	**Value addition and product differentiation to extend shelf life, absorb surplus volume, and capture higher retail margins.** Processing fresh pork into cured frozen products adds form and time utility, relieving live-market glut pressure and capturing downstream retail margins.
50	c	**Channel A achieves superior operational and pricing efficiency by reducing physical losses and intermediary markups, returning a larger share to producers.** Shortening the supply chain and maintaining chilled carcass handling cuts both physical spoilage (2% vs. 7%) and cumulative middleman margins (15% vs. 38%).