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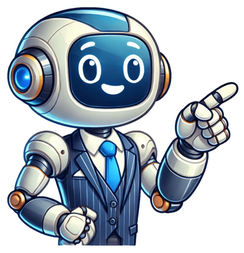

Agriculture science refers to the processes of cultivating desirable plants and breeding and raising livestock for commercial purposes. The practice of agriculture is usually referred to as farming. The scientists, laboratory technicians, geneticists, technologists and inventors are typically described as being involved in agriculture. One of the tenets of agriculture science is the breeding and raising of livestock. This refers to animals that are raised for human consumption. For example, chickens, turkeys, farmed fish, cows for beef, calves for veal and pigs for pork are part of the livestock system. Animals that are hunted for food, such as wild turkeys or deer, are not included as a part of agriculture science. Much of agriculture science is devoted to the production of plants as a source of human nutrition. This includes grasses, grains, fruits, roots, leaves, berries, plant seeds and vegetables. Some of the grasses and grains used for human food are wheat, oats and barley. Agricultural scientists may work on developing plants that can withstand dryer or wetter climate conditions. They may also work on changing the genes of plants to make them resistant to fungi, insects or worms. Other agriculture scientists work on increasing the productivity of plants, such as bushes that bear more or larger berries. Agriculture scientists might also focus on the flavor, color or texture of plants for human consumption, such as making genes for sweeter apples or cherries that are more tart. According to Science Daily, agriculture science also includes the production of fiber. This encompasses plant fibers, such as hemp, flax, linen and cotton. It also includes animal fibers, such as silk, mohair, wool, llama, cashmere, alpaca, yak and bison. Fibers that are gathered from the wild, rather than fibers grown purposefully, are not included in agricultural science. For example, qiviut is the fiber of the musk ox, and Inuit and Native Alaskan people follow the herds and collect these fibers in the springtime when the animals shed their winter coats. Related Resource: 20 Best Affordable Bachelor's in Agriculture Science Agriculture science also includes the production of feed for animals. The feed is generally for the animals that are also being raised for food. For example, much of the corn produced in the United States is used in feed. Some other feed crops include hay, pasture grass and silage. Some food grown for people has byproducts that are turned into feed or animals. For example, the husks of pineapple and the roots and leaves of sugar beets are turned into animal feed. Brewer's grains are also used for animal feed. Surplus food grown for human production may also be given to animals. Agriculture science is what allows for modern food production. It also encompasses many occupations, from the geneticists who change the genome of plants to make them resistant to pests or diseases to the people who drive the tractors that plant the seeds into the ground and the field workers who harvest the fruits and vegetables by hand, many people are involved in agriculture. Understanding what is agriculture science is gives a person a new perspective on what it takes to get food from the field to the table. Other Rankings of Interest: Get your hands on the Grade 12 Agricultural Sciences Noteset, the ultimate study guide for agricultural sciences students. This comprehensive set of notes includes all the key information and concepts needed to master the Grade 12 curriculum. Whether you're looking for past lessons or want to delve deeper into the content, these study notes are perfect to help you with your studies. With clear and concise explanations, diagrams and examples, you will be able to understand and apply the material with ease. 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You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Contact Contact Us Our Private Higher Education Institution Maremathlou Training Institute www.mare-gh.ac.za Physical Adress Main Campus, Plot 20/21 Floris Coetzee Road, Rayton Bloemfontein 9300 1. 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The not es focus on selected challenging content topics informed by experience of dedicated curriculum implementers and analysis of June results 2017 The not es are compiled from several class at t endance Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 5. 4 PAPER 1 1 . Animal Nutrition : A. Concepts Ruminant: Animal with a complex/compound stomach [eg. Cattle, Sheep, Goats] Non-ruminant (monogastric): Animal with a single/simple stomach [eg. Pigs, Poultry, Horses] Rumination: The process of bringing back the cud/bolus food into the mouth for re- chewing, re-insalivation and re-swallowing. Peristalsis: The movement of food through the alimentary canal / rhythmic contraction and relaxation of muscles of the alimentary canal. Retroperistalsis /regurgitation: The bringing back of food from the stomach to the mouth cavity. Chyme : The contents of the stomach Chyle: The contents of the small intestines Biological value (BV): The quality of proteins in the feed. B. Diagrams. Possible diagrams. I. Alimentary canal for a pig Carefully take note of the main parts of the alimentary canal of a pig and locate their functions in the process of digestion. Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 6. 5 II. Alimentary canal for poultry Attempt to label all labeled parts and the functions of D, H and N. III. Alimentary canal for cattle Identify all labeled parts and supply functions for C, D, L, IV. Process of rumination Sphincter A B C D E F G H I J K Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 7. 6 This process is critical in ruminants. It ensures that food ingested is properly chewed and re-swallowed for chemical digestion to continue. C. Calculations NB: In all calculations, don't forget to use a calculator. I. Digestibility coefficient: Note the formula and the calculations for digestibility coefficient Digestibility coefficient t= (Feed intake – moisture) – DM Excreted X 100 (Feed intake - moisture) OR Digestibility coefficient = Dry matter intake – Dry matter of manure X 100 Dry matter intake E.g. A cow eats 10kg of maize with a 10% moisture content and excreted 4kg of dry matter = 9 kg – 4 kg X 100 9 kg = 5 kg X 1OO 9 kg = 500 kg 9 kg = 55,6 % (56 %) Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 8. 7 ii. Nutritive ratio (NR) Note the following: Know the Definition of Nutritive Ratio NR is defined as a ratio used to determine the protein content of feed for animals Know the formula of NR Interpretation/implication of the Narrow and Wide ratios NR = 1: % Non-nitrogen substances % Digestible Protein (DP) OR NR = 1: %Total digestible nutrient (TDN) - %Digestible protein (DP) % Digestible Protein (DP) Calculate the NR— (a). Maize has a TDN of 80% and DP of 10% (b) Soya bean has a TDN of 72% and DP of 12% (c) Oats has a TDN of 95% and DP of 5% NR =1: 80 - 10 10 = 1:70 10 = 1:7 (Wide NR) above 1:6 .Suitable for Maintenance(more carbohydrates and less proteins) IF NR is 1:5 or less(Narrow NR) the feed is Suitable for growth , production and reproduction(MORE Proteins and Less carbohydrates). iii. Pearson square Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 9. 8 A Pearson square is used to balance rations. If for instance, a farmer has got Sorghum meal that contains 13% digestible protein (DP) and oilcake meal with digestible protein content of 23% . The farm animals kept require 17% digestible protein (DP), then the calculation for balancing the rations is done as follows: Sorghum meal 13% 6 parts oil cake meal 23% 4 parts 2. Animal Production Protection and Control: A. Concepts i. Animal Production Intensive production system Extensive production system Subsistence farming Commercial farming ii. Protection and Control Internal parasites External parasites Plant poisoning B. Structures Handling facilities C. Life Cycles 17% Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 10. 9 3. Animal Reproduction : - A. Concepts i. Primary and secondary reproductive organs (Male and Female) ii. Spermatogenesis : - iii. Oogenesis/Ovigenesis iv. Ovulation v. Oestrus vi. Gestation/Pregnancy vii. Parturition viii. Lactation ix. Dystocia D. Diagrams i. Female reproduction system Identify labels in the diagram below: A C B D E Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 11. 10 ii. Spermatogenesis Take note of how the process unfolds in the testes iii. Oogenesis Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 12. 11 PAPER 2 1. Agric. Management and Marketing :- A. Concepts i. Demand ii. Supply iii. Market equilibrium vi. Market B. Graphs Demand, supply curve and market equilibrium C. Diagrams / Pictures 2. Production factors A. Concepts i. Land ii. Labour (labour legislations) iii. Capital Iv. Management B. Graph Law of diminishing returns Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 13. 12 iii.Genotypes vi.dominance v. Atavism vi. Prepotency vii. Mutation viii. Variation xi. Selection x. Monohybrid & Dihybrid crosses(Mendel's laws) B. illustration and schematic representation Parents BB x bb meiosis Gametes B B b b F1 generation Bb Bb Bb Bb Ii.Punnet square Gametes B B B Bb Bb B Bb Bb 3. Basic Agricultural genetics i. GMOs (definition, benefits and risks) II. Phenotypes A. Concepts Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 14. 13 A. GENETIC CONCEPTS: *Monohybrid cross /monohybridism= when a single factor is involved in cross breeding. Eg Tallness x shortness *Dihybrid cross /dihybridism = when two factors are involved in cross breeding. eg Tall &Light x short & dark *Phenotype ======= physical/outward appearance of an organism *Genotype ======= genetic composition of an organism *Alleles ======= alternate forms of genes/pairs of Genes (TT, Tt, tt, WW, Ww, ww) *Homozygous alleles== similar/identical pairs of Genes (TT, tt ,WW, ww, BB, bb) *Heterozygous alleles== dissimilar pairs of genes(Tt, Ww, Bb Zz, Ll, Dd) *Prepotency======= ability of an organism/individual to transmit its characteristics to the offspring/progeny. *Atavism======== Reappearance of ancestral characteristics BASIC GENETICS IN DETAIL Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 15. 14 B.MONOHYBRID CROSS -when a single factor is involved in cross breeding B.1.WITH DOMINANCE (COMPLETE DOMINANCE) T=tall, t=short enotype= P1: TT x tt (homozygous parents) Meiosis T T t t (gametes) F1: Tt Tt Tt Tt (All hybrid tall & heterozygous offspring) t t T Tt Tt T Tt tt Punette square Tt x Tt (tall & heterozygous) T t T t (gamete) F2: TT Tt Tt tt Punette Square T t T TT Tt t Tt tt RATIOS: Phenotype== Genotype=== % : Tall=== Pure bred (very) tall=== Hybrid (medium) tall== Reccessive (very) short Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 16. 15 B.2. WITHOUT DOMINANCE (INCOMPLETE DOMINANCE) *Mendell used flowers of different colours eg Red flowers(R) and a White flower(r) Genotype: P1 = RR x rr meiosis R R r r (gametes) r r R Rr Rr R Rr Rr Rr x Rr (Pink and heterozygous) Meiosis R r R r F2== RR Rr Rr rr (How many colours do you see?) Punette square F2 Generation R r R RR Rr r Rr rr For you to do: Give the ratio of each of the following: Phenotype= Genotype= Give the % of : Red flowers= Pink flowers= White flowers= Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 17. 16 C. CO-DOMINANCE There is NO Recessiveness Both characteristics (colours) are dominant Both colours of the parents will equally appear in the offspring The offspring will have a Roan colour Eg. BB (Black bull) x WW (White cow) / Meiosis B B x W W (gametes) F1 BW BW BW BW (Roan colour) Summary: DOMINANCE INCOMPLETE DOMINANCE CO-DOMINANCE COLOUR OF OFFSPRING One colour is dominant and the other is recessive. The offspring resembles one of the parents There is no dominance None of the parents' colours will be visible to the offspring The offspring has one colour which is completely different from its parents There is no recessiveness Both colours are dominant Both colours of the parents equally appear in the offspring This colour of the offspring is called a Roan colour (White and Black spots/patches) Downloaded by Surprise Ramahlo (surpriseramahlo1930@gmail.com) lOMoARcPSD|29919704 18. 17 C.DIHYBRID CROSS -Two factors are involved in cross breeding Mendell used seeds Round (R) and Yellow (Y) x Wrinkled (r) and green (y) Genotype: P1 = RRYY x r r yy Meiosis RY RY RY RY ry ry ry ry (gametes) genes in pairs F1: === RrYy (All Round and Yellow & heterozygous) Punette Square- F1 RY ry ry ry Ry RY RrYy RrYy RrYy