GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION

APPLIED AGRICULTURAL SCIENCE SG

QUESTION 1
DAIRY FARMING

1.1 S.A. cannot be considered a country with ideal conditions for dairy farming – low rainfall distribution problems – milk production is widely practised – concentrated near allies – dairy production is not yet completely self-supporting -
Dairy products have to be imported
A characteristic is the changeability because of climatic factors
Low standard of production
Low calving percentage
Seasonal character of production
Diseases and pests (8)

1.2 Greatest attention should be given to the parents – most influence
Attention should also be given to close ancestors – that exhibit one or more poor characteristics
With pre-potency, attention should be given to the descent of the animal – indicate line breeding
A breeder wishing to select a sire for his herd – by means of stud book will have to check whether the sire shows relation to his herd. (8)

1.3 Efficient control of venereal diseases most economical method of mating
most efficient technique of cattle improvement
many cows can be inseminated
many bulls are available
handy and accurate method
increases the commercial value of herd
calving percentage better
bull from overseas can be used
seeds of bulls can be frozen (8)

1.4 Rich in vitamins – resist diseases
laxative effect – sets alimentary canal in action
rich in minerals – helps bare formation and normal body functions
protein content is 5 times as high as in milk – good start to growth
fat content – high energy
solids twice as high (8)

1.5 1.5.1 After calving, milk production usually rises rapidly – peak 30 to 60 days
After that production gradually starts to decrease at a temp/rate of 5 – 6% per month

1.5.2 Milk production rises at a decreasing tempo up to the age of eight years and then declines at an increasing tempo – mature cows produce 25% more milk than 2 year-old heifers

1.5.3 Large cows produce more milk than small cows – but milk yield is not directly related to body mass

1.5.4 Breed – milk production is partly a hereditary characteristic
Different breeds different production

1.5.5 When oestrus occurs milk yield may temporarily decrease for a day or two
Influence on total production is negligible

1.5.6 A dry period of approximately 60 days between lactations is essential for fair milk production. If dry period is shorter, production will decrease. (12)

1.6 (6)

1.7 Rumen and body capacity
Milk production
Individuality
Palatability
Digestibility (6)

1.8 1.8.1 To build up body reserves for development of the unborn calf
To give the udder a chance to rest and recover
To give rumen a chance to recover (4)

1.8.2 42 – 60 days (1)

1.8.3 Requires the expected calving date (1)

1.8.4 To reduce milk production
Cows can be dried off suddenly
Dry cow treatment (3)

1.9 Milking shed
The cow
The milkers
Milking machines
Dairy utensils
Diseases
Feeds
Straining of milk (10)

1.10 Feed a ration high in phosphate but low in calcium. Avoid 100% green fodder shortly before calving. Start using a normal high calcium ration after calving.
Milk out only under close observation. Keep suspect cases in small groups.
Prevent cows from being over fat. Prevent stress at times of parturition
Adopt the rumen flora. Lower the rumen pH. (11)

1.11 Sterilisation
Pasteurisation
Milk powder

Condense milk
Evaporated milk (6)

1.12

FEEDS

ROUGHAGES		**CONCENTRATES**	
DRY	**JUICY**	**DRY**	
	RICH PROTEIN	**POOR PROTEIN**	(8)

[100]

QUESTION 2
MAIZE PRODUCTION

2.1 Maize, more than any other crop is presently cultivated in more areas.
Maize utilised for animal feed
End product – eggs and meat
Staple food humans
Starch is changed by enzyme activity into products – used as additives in various household goods like beer, ice-cream, syrup, shoe polish, popcorn – used as packing material (6)

2.2 1. Main stalk stem
2. Beard
3. Bract
4. Guide cell
5. Inter node
6. Node
7. Bud
8. Ear stem
9. Leaf sheath (9)

2.3 2.3.1 Permanent effect on yield
Susceptible drift sand damage
Hail and frost
Water logging may be harmful
Tilling close to plants may be harmful. (4)

2.3.2 Nutrient deficiency will restrict leaf growth
Hail may cause yield loss
Water logging may cause damping-off (2)

2.3.3 Hot soil surfaces affect development of prop roots
Water and nutrient deficiencies may affect development
Hail damage (3)

2.4 2.4.1 Texture refers to size of particles
Involves ratio of sand clay
This ratio determines the capacity and strength
Clay stores more water
The arrangement of particles to form layers is known as structure
The object of soil tillage is to maintain the structure
Wrong tillage methods will break down structural units (4)

2.4.2 Bulk density is the mass per unit volume
Porosity the portion that is filled with water or air
If bulk density increases porosity decreases
Distribution of pore size is important because plant growth is affected
Tillage must aim at obtaining a balanced ratio (4)

2.4.3 The hydraulic conductivity of a soil is the ability to convey water under the influence of a driving force – gravity. The most important factor affecting this is distribution of pore size. The pore size is influence by tillage. (2)

2.5 2.5.1 The most important processes affected by soil tillage include infiltration and evaporation. The soil tillage should be aimed at optimising infiltration. Keep top soil loose – rapid infiltration – decrease in evaporation. Initially evaporation will be high – will decrease in short period. Using wrong implements – at wrong times can detrimentally affect the infiltration. Don't use same implement year after year (same depth). (4)

2.5.2 Soil temperature and water affect seed germination – germination and root growth are affected by tillage methods – soil temperature can be manipulated and evaporation reduced. Under cool growing conditions plant residues on the soil surface may lower the temperature. (4)

2.6 Lower fuel consumption
Lighter implements
Can adapt quicker to optimum planting date
Machinery cost lower
Best control wind in water erosion
Less compaction (12)

2.7 Never replace a reliable cultivar after one season.
A range of cultivars spreads risk
Cultivars must be adapted to a specific yield potential
Revise the choice of cultivars annually
Consider all the characteristics of a cultivar (4)

2.8 Combats diseases
Maintains high organic content
Prevents one-sided utilisation
Economical way of maintaining fertility
Two or more crops
Different root depths
Decreases slade period
Distributes the risk of failures (8)

2.9 Growth stage of weeds
Growth rate
Climate affects growth rate, rain can wash off the remedy
Tank mixtures of the remedy plus a wetting agent improves the adhering
Application method as well as suitable equipment (10)

2.10 Financial records any six (6)

2.11 Nitrogen – phosphorus
Potassium – Magnesium – Calcium
Sulphur (4)

2.12 A plant growing in a place where it is not wanted, even though it may be an agronomic crop. Example maize plants in a wheat crop. (4)

2.13 2.13.3 Larvae eat large holes through the leaf – holes are visible in rows across leaves -
Faeces always found near feeding sites. (4)

2.13.2 Larvae feed on silks of young ears – pollination cannot occur – also opens the tips of pollinated ears by feeding on the top part of leaves – ears may rot due to rainwater. (4)

2.13.3 Have characteristic patterns of three longitudinal dark bands – colour may vary between yellow, green, pink, brown and black. One prominent pale band on each side of the body – body covered with hair. (3)
[100]

QUESTION 3

3.1 Quality of eggs is tested by passing them over bright light – light shows up any faults.
Graded according to weight – three quality grades A, B and C – best stored on one of the lower shelves of the fridge – egg racks in the fridge door are not always ideal – too close to freezing unit – can stay fresh for three weeks – can also be kept in any cool place.
Keep eggs away from strongly flavoured foods – store eggs pointed-end down – for long term storage – up to 10 months may be quick frozen. (10)

3.2 Egg powder may be prepared from whole egg yolk or whites. Most commercial powders are spray – dried – Dehydrated eggs can be incorporated in mixes prepared for baked products – They are widely used – The small amount of glucose is removed by an enzyme or microbial fermentation – because the pressure causes on unpleasant flavour. Eggs must be pasteurized before they are dried – eggs are spray-dried or pan-dried – keep best if they are dried to a low moisture content. (6)

3.3 3.3.1 Fryer-roaster
Young hen
Young tom
Yearling hen
Yearling tom
Matured or old turkey (6)

3.3.2 (a) 7 – 12 weeks 1,5 kg (2)
(b) 8 months 6 kg (2)
(c) 3 – 5 months 4 – 5 kg (2)

3.4 Cut off head – wings
Cut down back to tail
Use fingers and a knife loosen the flesh from carcass
Scrape flesh from breast bone
Loosen flesh from carcass
Working from inside loosen flesh from bones of the legs
Do not damage skin
Remove thigh bone – pull out
Remove bone from drumstick – pull
Cut the wish bone from breast
Cut out the wing bone
Season
Stuff
Fold neck skin back
Tie the breast with string (14)

3.5 Does not contain the nutrients in correct proportion – too many proteins
Does not add to peristalsis – it is completely absorbed
Price of milk varies according to locality and the season
Comparatively expensive (6)

3.6 Clean receptacles
Chilling
Boiling
Storing in the form of processed products (8)

3.7 3.7.1 Churning will take a very long time – find result not good
Cream should have a fat content of about 33%
It is better for the liquid to be too thin rather than too thick (5)

3.7.2 The temperature of the cream to be churned is very important
Too cold – it won't churn at all – too warm – slack mass
Temperature should be 12°C in warm weather and 14°C in colder weather. (5)

3.8 Very lean
Lean
Medium
Moderately over fat
Excessively over fat (4)

3.9	3.9.1	Leg	3.9.7	Flank
	3.9.2	Round	3.9.8	Sirloin
	3.9.3	Tail end	3.9.9	Brisket
	3.9.4	Sirloin	3.9.10	Bolo
	3.9.5	Fillet	3.9.11	Neck

3.10 Sanitary conditions
Animal must be in good health
Proper bleeding
Body temperature drop must be rapid
Use good quality wrapping
Holding temperature must be correct
Ageing of meat – restrict period (7)

3.11 Bacon – ham – corned beef
Spiced beef – sausages
Braun – pate – meat pie
Terrine (9)

TOTAL: 300