

EXAM MARKING KEY

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Marking Key for Sample Animal Production Systems Exam

SECTION 1 (SHORT RESPONSE)

Question 1a Symbol meaning

(Outcome 2)

Mark	Description	Notional level
1	Cold Front	4

Question 1b Pressure systems for X and Y

(Outcome 2)

Mark	Description	Notional level
2	X= Low pressure system. Y= High pressure system	4
1	Either one of the 'above'	

Question 1c Wind direction

(Outcome 2)

Mark	Description	Notional level
1	Clockwise	5

Question 1d Prediction of weather change and consequence on an animal production.

(Outcome 2)

Mark	Description	Notional level
2	Prediction: light winds at 10pm, increasing with rain forecast as the front approaches with possible storms. Possible consequence: young stock may be at risk of wind chill exposure.	6
1	Prediction only	

Question 2a One criterion for assessing the quality of the product.

(Outcome 2)

Mark	Description	Notional level
1	Example: Milk. The hygienic quality of fresh milk is tested by using the 'bulk milk cell count'.	4

Question 2b
Two actions to maximise the quality of the product.

(Outcome 2)

Mark	Description	Notional level
1-2	Describes two viable actions. Example: Washing cows' udders Teat dipping Thorough flushing and cleaning of dairy equipment and tanks Refrigeration of farm milk vats at 4 degrees C	5

Question 2c
Agencies or organisations contributing to marketing of product.

(Outcome 2)

Mark	Description	Notional level
2	Example given. Explanation given. e.g. Dairy Corporation is responsible for milk marketing. The aim is to increase milk consumption and awareness through campaigns such as ' Milk, Legendary Stuff '.	6
1	Example only given.	

Question 2d
How do agencies or organisations contribute to the marketing of the product?

(Outcome 2)

Mark	Description	Notional level
3-5	<ul style="list-style-type: none"> States an example of scientific research Describes research and states a specific example that has an impact on the production process of the named product Forms a simple conclusion about the impact of research on the production process The conclusions are valid <i>e.g. Research into the effect of feeding concentrates and grains as a supplement to pastures for dairy cows has had a positive impact on the quality and quantity of milk. Not only has the proportion of farmers feeding concentrates or grain increased but the quantities used have risen markedly to 54 t and 82 t per farm respectively. As a result, average milk production per cow has risen in the past decade from 4000 L to 4300 L per year.</i>	6-8
2	<ul style="list-style-type: none"> States an example of scientific research Describes research 	
1	<ul style="list-style-type: none"> States an example 	

Question 3a
Price trends for wool, beef and wheat

(Outcome 4)

Mark	Description	Notional level
1-3	On average and using best line of fit: *Beef prices remained relatively constant *Wheat prices have dropped in value *Wool prices have dropped but had a significant spike in prices in 1987	6/7

Question 3b
Two possible changes if the trend continues.

(Outcome 4)

Mark	Description	Notional level
1-2	Describes two possible changes. <ul style="list-style-type: none"> • Change to a more profitable enterprise • Diversify farming practices, where, if one enterprise is not so lucrative, another will compensate 	7

Question 4a
Identify and describe a significant characteristic in a breeding system.

(Outcome 2)

Mark	Description	Notional level
1-3	Identifies the characteristic; amount of fat on animal. Describes the market requirements: generally, domestic markets buy cattle which weigh up to 425kg live weight. Fat range 6-11mm on P8 site.	4

Question 4b
Objective measurement used to monitor the characteristic.

(Outcome 2)

Mark	Description	Notional level
1-5	Describes an objective measurement; condition scoring/ fat scores with a range of 1(lean) to 5(very fat). Explanation of how or where the measurement is used. Main areas to manually assess are: <ul style="list-style-type: none"> • short ribs of loin • over the long ribs • around the tail head. 	5

Question 4c**Explain how a producer can effectively meet the stated characteristic in the breeding program.**

(Outcome 2)

Mark	Description	Notional level
1-4	<p>Explain how this characteristic has been identified <i>e.g.: As a beef producer the aim is to provide a product which is accepted by the market place.</i></p> <p>Explain how the breeding program can be modified <i>e.g.: A breeding program should be modified to meet these requirements by performance testing.</i> <i>This measures the characters in the offspring.</i> <i>The aim being to measure the genetic value of an animal in relation to a particular character .</i></p>	5

Question 5a**What is meant by a Feed Conversion Ratio?**

(Outcome 2)

Mark	Description	Notional level
1	<p>Definition: $FCR = \frac{Wt\ of\ feed\ eaten}{Weight\ gained\ by\ animal}$ OR = amount of feed required (kg) to produce 1 Kg body weight (live weight)</p>	4

Question 5b**Ruminant animals and FCR**

(Outcome 2)

Mark	Description	Notional level
1-2	<p>FCR is higher in ruminants. In ruminants, the digestible energy is less due to the rumenification process and production of methane gas, which makes the feed conversion ratio less efficient.</p>	6

Question 6
The oestrous cycle

(Outcome 2)

Mark	Description	Notional level
1-8	<i>FSH</i> is released from the <i>Pituitary gland</i> and stimulates a <i>follicle</i> to develop in the ovary. Once the follicle is developed, the ovary releases the hormone <i>oestrogen</i> which stops FSH production. The pituitary gland releases the hormone <i>Luteinising hormone</i> which makes ovulation occur. After ovulation the follicle degenerates and becomes the <i>corpus luteum</i> which releases <i>progesterone</i> . This stops the oestrous cycle and prepares the body for pregnancy. If pregnancy does not occur the uterus produces prostaglandins to reduce the size of the corpus luteum and progesterone levels. This stimulates the <i>pituitary gland</i> to release FSH and the cycle starts again.	5

Question 7a
Collect and record data

(Outcome 3)

Mark	Description	Notional level
1-5	Muster stock into cattle yards and draft out calves from cows. Check for any OHS hazards. Select and assemble scales for weighting Weigh calves Record data according to enterprise requirements Repeat this procedure 3 times (date of birth, weaning and 200 days of age)	4-5

Question 7b
Calculate growth rate and corrected 200 day weight

Mark	Description	Notional level
1-2	Growth rate for 607=0.41 Corrected 200 day weight=117 kg	4-5

Question 7c
Rank order from cow 607 to B21

Mark	Description	Notional level
2 if no mistakes (1 if one mistake)	Rank order from cow 607 to B21 is 11,3,7,6,5,10,9,8,1.4,12,2	4-5

Question 7d
Cows to keep as breeders

Mark	Description	Notional level
14 marks (1 for each selection, 1 for each reason)	108 Beef dam, young, large calf, high growth rate (gr) A9 Beef dam, mid-age, med calf, high gr 40 Beef dam, mid age, med calf, high gr 802 X-bred dam, 1 st calf, med calf, m gr 30 X-bred dam, mid-age, lge calf, v high gr 105 Beef dam, young, med-lge calf, high gr B21 Beef dam, mid-age, lge calf, v high gr	6

Question 7e
Cows to cull

Mark	Description	Notional level
10 marks (1 for each selection, 1 for each reason)	B8 mid age, good milk, high gr, BUT fence breaker 35 old, small calf, low gr U50 old, large calf, low gr 607 2 nd calf, v small calf, v low gr U52 old, large calf, dystocia	6

Question 7f
Heifers for the 2007 herd

Mark	Description	Notional level
2	906 beef/dairy cross, hfr out of 30, vh gr	6

Question 7g
Steers/bulls and heifers for immediate sale

Mark	Description	Notional level
7 (1 for each selection, 1 for identifying market)	904, 905, 912, 913, 914, 915 The reason is they are all at marketable weight for vealer market.	6

Question 7h
Steers/bulls and heifers for feedlot and sale in December/January

Mark	Description	Notional level
5 (1 for each selection, 1 for reason)	907, 908, 909, 916, the reason for feed lotting is the calves are too light weight and low growth rates.	6

Question 8a
Design a process to specify relevant data needed. Carry out the evaluation

(Outcomes 1,2,3 and 4)

Mark	Description	Notional level
1	Data needed: > Sire used in 2006/7 seasons > Beef Market requirements 2006/7/8	7,8
1	Data to be collected: 2006 culled breeders > Market value of culls	
5	Data to be collected: 2007 breeders > Sire used > Calf weight > Calf sex > Weaning weight > Corrected 200 day weight	
5	Data to be collected: 2006 market response > Carcass qualities for vealers > Return on vealers > Carcass qualities for feedlot calves > Gross Return on feedlot calves > Gross margin of feedlot calves	
5	Data to be collected: 2007 market response > Carcass qualities for vealers > Return on vealers > Carcass qualities for feedlot calves > Gross return on feedlot calves > Gross margin of feedlot calves	
1	Process > Propose a hypothesis such as: <i>“the decisions made about 2006 cattle are effective for improving production during 2007 to meet market requirements for beef product and farm business needs for viability and sustainability”</i>	
1	> Devise ways to collect the appropriate data {as listed above} such as: <i>Countryman, Elders Weekly, Market reports and trends, Butchers, Supermarkets, own data</i>	
1	> Represent the data in a communicable format that is easy to follow and includes justifications for decisions made {as in above answers}	
1	> Analyse the data in terms of productivity of dams from market price and quality reports over 2006/7 seasons, i.e. productivity of calves for 2007 informs performance of selected dams and influence of the sire which can be compounded with 2006 calf market data to reinforce productivity of cows, coupled with choice of sires to meet the market requirements {indicated by prices and quality achieved in conjunction with herd's cow breeds.}	
1	> Evaluate the productivity of the cows and their calves in terms of the original hypothesis to determine the impact on beef market requirements, farm viability and sustainability	
1	> Communicate findings as a component of the advice requested by the farmer	

Question 8b
Make recommendations about potential sires

Mark	Description	Notional level
	Data to be collected: Performance data	
1	➤ on breeds of sires suited to achieving market requirements with base breeding herd	
1	➤ on breeds of dams suited to increasing herd size	
1	➤ on beef production forecasts	
1	➤ costs of purchasing live sire or semen	
	Process	
1	➤ Gather data	
1	➤ Analyse data on sires that have a tendency to produce the current and predicted beef product with the current cow breeds.	
1	➤ Explore the opportunity to increase production further by selecting sires and additional/alternative breed(s) of cows to expand the herd.	7,8
1	➤ Consider the impact of sire on age/size of existing dams and any new dams purchased for 2008	
1	➤ Predict the outcome of maintaining the same breed of sire compared to selecting different sire(s) for the herd {include impact on marketability as well as cost to replace vs. return for additional investment (in a new sire)}	
1	➤ Present and incorporate your findings in a clarifying but objective report to the farmer	
Total=10		

Question 8c
Make recommendations regarding an increase in female breeders

Mark	Description	Notional level
	Data to be collected: Performance data	
	➤ on breeds of sires suited to achieving market requirements with base breeding herd	
	➤ on breeds of dams suited to increasing herd size	
	➤ on beef production forecasts	
	➤ costs of purchasing dams of selected breed or nurse cows and embryo transfer	
4	Process	
	➤ Gather data	
	➤ Analyse data on dams that have a tendency to produce the current and predicted beef product with the current or proposed sire breeds.	
	➤ Explore the opportunity to increase production further by selecting additional/alternative breed(s) of cows including impact of cost, size, health and availability and appropriate sires to expand the herd.	6,7,8
6	➤ Consider the impact of age/size of existing dams and any new dams purchased for 2008 when selecting sire(s)	
	➤ Predict the outcome of maintaining the current herd size and composition vs. expanding the herd using same/different dam breeds{include impact on marketability as well as cost to replace vs. return for additional investment }	
	Present and incorporate your findings in a clarifying but objective report to the farmer	

SECTION TWO: EXTENDED ANSWER

(Students choose 1 of the 2 questions)

Question 1

Identify, explain and evaluate one technique that a farmer may use to manipulate the oestrous cycle.

(Outcomes 2 and 3)

Mark	Description	Notional level 6,7,8
1	List the technique (possibilities are: Artificial Insemination, Flushing, Embryo transfer)	
1+1	Justify the technique: (e.g.: AI can be used by farmer to select specific characteristics from particular bulls based on EBV to suit individual cows and improve the progeny.)	
2: definition 1: explanation of synchronisation 1 involving hormones 1 +1 for listing 2 methods 1= use of intra-vaginal device 1= stimulates wall of uterus 1=prevents ovulation 1=withdraw and FSH secreted 1=time of insemination 2 = 2 doses and time span 2=action of each dose of hormone 1= time of insemination 2=combination	Describe the technique. (e.g. Artificial Insemination is the act of using instruments to deposit semen in the female reproductive tract with the aim of achieving pregnancy. Oestrous is synchronised in a herd of animals for ease of management. This involves bringing all animals into oestrous together. Synchronisation involves treating animals to be inseminated with hormones so will come into oestrous and ovulate at the same time. 2 common methods 1. Progesterone treatment (specific models provided for cattle and sheep) Progesterone-releasing intra-vaginal device (PRID) or (CIDR) attached to plastic coil and inserted into cows vagina Removed 10– 2 days later. This progesterone stimulates development of wall of uterus and prevents ovulation by inhibition of FSH production. When it is withdrawn FSH is secreted, resulting in ovulation. Insemination occurs 56 hours after withdrawal of coil. (Sheep: Pessary (sponge) is inserted into ewe's vagina Removed after 14 to 16 days Insemination occurs 48–60 hours later) 2. Prostaglandin injection: Oestrous and ovulation occur after giving 2 doses 10 to 12 days apart. First dose reduces corpus luteum and subsequently progesterone levels. Second dose stimulates FSH and subsequently ovulation Insemination 48 hours later 3. Combination of both above methods where CIDRS and prostaglandin injections are used.	
	Evaluate the technique	

Mark	Description	Notional level 6,7,8
1	Benefits: synchronisation for ease of management	
1	Birth of offspring condensed into shorter period	
1	Sale of offspring as an even pen or lot.	
1	Larger gene pool to choose from	
	Use of info from EBVs provided based on previous performance	
2	of chosen sire	
	Disadvantages:	
1	Heat detection and yarding takes extra time	
	Risk of reduced fertility due to poor insemination technique	
	Inseminator careless with hygiene spreads disease	

Question 2

Identify six main classes of safe veterinary chemicals and explain the importance of adequate labelling. Predict one consequence if these instructions aren't followed.

(Outcome 2 and 3)

Mark	Description	Notional level
2	<p>States and describes one aspect of the safe use of chemicals eg: protective clothing and equipment protects the handler or Application only when conditions are suitable, such as low wind to avoid contamination of waterways etc by spray drift or Labelling secure storage and safe disposal of containers to avoid possible contamination of environment via spillage or corrosion or Follow directions on label, such as rates of dilution and application rates to ensure that contamination is avoided and chemical resistance is reduced.</p>	
12 (2 marks per class identification and description)	<p>Lists and describes the 6 main classes of veterinary chemicals</p> <ol style="list-style-type: none"> 1. Antibiotics: chemical compounds which may be derived from living organisms or synthesised, which are capable, in small amounts, of curing diseases caused by bacteria (e.g. penicillin) Injected intramuscularly 2. Hormonal Growth Promotants(HGPs) used in meat production. e.g.. Ralgro, Compudose. Pellets containing these substances are implanted in cattle in order to improve feed conversion growth rates. 3. Pesticides: substances intended for preventing, destroying, repelling or reducing the harmful effects of external parasites of animals. e.g. Topclip Blue Shield, WSD Spurt. Commonly applied through dips, sprays, spot-on, pour-on dusting powders. 4. Anthelmintics: substances which are given to control internal parasites (usually worms). Methods of administration include drenching, injection, pour-on, and in feed. e.g Nilverm, Ivomec 5. Vaccines: biological products that provide animals with protection against specified diseases when used according to instructions. Injected under the skin (subcutaneous) 6. Minerals and Vitamins: supplements used to correct true deficiencies diagnosed by a vet or farm consultant. e.g. vitamin B12, Selenium. Administered by injection or 'bullets' inserted into the rumen. <p>All products should be approved by relevant authorities labels include recommended directions as follows:</p> <ul style="list-style-type: none"> • Composition/active ingredient= type and quantity of chemicals in preparation • Indications for use= what drug does when used on target animal • Contra-indications and incompatibilities = gives conditions/situations when product is not to be used as instructed • Suggested rate, frequency and duration of dosing= directions for use and how much, how often • Preferred route of administration= how to administer • Information on toxicity = poison classification of the product <p>Suitable withholding period= Minimum time period that should elapse from the last day</p>	4,5,6,7
14 marks (7 out of the 9 dot points)		

Mark	Description	Notional level
	<p>of treatment to the day of slaughter or collection of product.</p> <ul style="list-style-type: none"> • Safety, first aid, storage and disposal instructions instructions for personal safety, what to do if poisoning occurs, conditions of storage prior to use, disposal to avoid contamination of environment • Expiry date date at which the product is no longer considered effective 	