

Pearson BTEC Level 3 National in Animal Management

Unit 1: Animal Breeding and Genetics



Sample Assessment Materials (SAMs)

*For use with Extended Diploma in Animal
Management with Science*

First teaching from September 2016

Issue 2

Edexcel, BTEC and LCCI qualifications

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Changes to rubrics

The rubrics in this Sample Assessment Material have been updated to provide clarity on the rules under which the task should be taken. Centres should read the Instructions for Teachers and Instructions for Learners sections carefully to understand the full detail of the changes. These changes have been summarised below for ease of reference:

Summary of Sample Assessment Material changes

Part A - Summary of changes made between previous issues and this current issue	Page number
6th paragraph and bullets Paragraph on learners' notes has been changed and expanded to include more rules on what notes can be taken into the supervised assessment and what the content of these notes should be. This is to ensure centres understand what limits should be placed on learners in notetaking.	Page 2
8th paragraph The paragraph on centres timetabling the supervised assessment period has been removed and replaced with wording on Pearson defining the supervised assessment period. This is to increase the rigour of the task by ensuring all learners must take it in the same timeframe.	

Part B - Summary of changes made between previous issues and this current issue	Page number
The paragraph on centres timetabling the supervised assessment period has been removed. As in Part A the supervised assessment is now timetabled by Pearson.	Page 6
Maintaining Security Bullets have been added to give teachers more information on how to maintain security for the task, including arrangements for supervised assessment, and for how the learners' work and notes must be kept securely. These bullet points have been added to clarify supervising requirements for supervised assessment time.	

Pearson BTEC Level 3 Nationals

Write your name here

Surname

Forename

Level

3

Animal Management

Unit 1: Animal Breeding and Genetics

Part

A

Extended Diploma in Animal Management with Science

Sample assessment material for first teaching

September 2016

Instructions

- **Part A** contains material for the completion of the preparatory work for the set task.
- **Part A** is given to learners 2 weeks before Part B is scheduled. Learners are advised to spend no more than 6 hours on Part A.
- **Part A** must be given to learners on the specified date so that learners can prepare in the way directed.
- **Part A** is specific to each series and this material must only be issued to learners who have been entered to undertake the task in that series.
- **Part B** materials must be issued to learners for the supervised session.



Paper reference

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Instructions to Teachers/Tutors

This set task has a preparatory period. Part A sets out how learners should prepare for the completion of the task under supervised conditions.

Part A should be issued to learners 2 weeks prior to undertaking Part B of the assessment.

Learners should familiarise themselves with the specific context given in this Part A booklet.

Learners are expected to spend up to 6 hours in undertaking Part A.

Centres must issue this booklet at the appropriate time and advise learners of the timetabled sessions during which they can prepare. It is expected that scheduled lessons or other timetable slots will be used for some or all of the preparation.

Learners may prepare summary notes on the context. Learners may take up to 4 sides of notes of this type into the supervised assessment (Part B booklet). Other content is not permitted.

- Learners notes must be written in bullet form
- No full sentences or extended essays are allowed
- Learner's notes may contain information on generic principles arising from the scenario and the unit content

Part B must be completed under supervision. The supervised assessment uses the Part B booklet. This is a task book.

The supervised assessment will take place in a timetabled session specified by Pearson. Centres should schedule all learners at the same time or supervise cohorts to ensure there is no opportunity for collusion.

The set task is a formal external assessment and must be conducted with reference to the instructions in this task booklet and the Instructions for Conducting External Assessments (ICEA) document to ensure that the preparatory period is conducted correctly so that learners have completed their preparation validly and independently.

Teachers/tutors should note that:

- Learners should not be given any direct guidance or prepared materials
- Learners should not be given any support in writing or editing notes
- All work must be completed independently by the learner
- Learner notes will be retained securely by the centre after Part B and may be requested by Pearson if there is suspected malpractice.

Instructions for Learners

Read the set task information carefully.

In Part B you will be asked to carry out specific (written) activities using the information in this Part A booklet and your own research on this topic.

In your preparation for Part B using this Part A booklet you may prepare short notes to refer to when completing the set task. Your notes may be up to 4 sides and may be handwritten or typed and printed.

Your notes:

- must be written in bullet form
- must not contain full sentences or extended essays
- may contain information on generic principles arising from the scenario and the unit content.

You will complete Part B under supervised conditions.

You must work independently and should not share your work with other learners.

Your teacher may give guidance on when you can complete the preparation.

Your teacher cannot give you feedback during the preparation period.

Set Task Brief

You are required to carry out research into the context provided in the Set Task Information below. You should consider the following areas in relation to the context:

- the animal breeds and their breeding standards
- husbandry requirements, care plans and reproductive behaviours for those breeds.

You will be allowed a maximum of 4 sides of A4 of your individually prepared notes to support you during the supervised assessment. You are expected to spend approximately 6 hours conducting your research.

Set Task Information

Home Farm is a small, local farm park. The park operates as a visitor attraction and keeps livestock that appeals to families with young children. The park also operates as a working farm through the sale of livestock and their products.

You have been asked by the manager of Home Farm to provide information that can help the manager and staff in conducting a sound approach to the breeding of animals in the park. The manager is specifically interested in breeding goats and needs more information about domestic goat breeds and their breed standards. The manager has highlighted the following breeds as of particular interest:

- Saanen
- Boer
- Golden Guernsey
- Alpine.

In your most recent conversation with the manager he indicated that he wanted to know about husbandry requirements, care planning, and mating/reproductive behaviours for these breeds.

Pearson BTEC Level 3 Nationals

Write your name here		Level 3
Surname	Forename	
Learner Registration Number	Centre Number	
<input type="text"/>	<input type="text"/>	
Animal Management		Part B
Unit 1: Animal Breeding and Genetics		Marks <input type="text"/>
Extended Diploma in Animal Management with Science Sample assessment material for first teaching September 2016		Supervised hours 2

Instructions

- **Part A** will need to have been used in preparation for completion of **Part B**, under supervised conditions.
- **Part B** booklet must be issued to learners as defined by Pearson and should be kept securely.
- **Part B** booklet must be issued to learners for the specified session.
- **Part B** is specific to each series and this material must only be issued to learners who have been entered to undertake the task in that series.
- **Part B** should be kept securely until the start of the supervised assessment session.



Paper reference

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Instructions to Teachers/Tutors

Part B set task is undertaken under supervision in a single session of 2 hours on the timetabled date.

Part B set task requires learners to apply understanding gained through familiarisation with the context. Learners should bring in notes as defined in **Part A**. The teacher/tutor needs to ensure that notes comply with the requirements.

Learners must complete the set task using this task and answer booklet.

The set task is a formal external assessment and must be conducted with reference to the instructions in this task booklet and the Instructions for Conducting External Assessments (ICEA) document to ensure that the supervised assessment is conducted correctly and that learners submit evidence that is their own work.

Learners must not bring anything into the supervised environment or take anything out without your approval.

Centres are responsible for putting in place appropriate checks to ensure that only permitted material is introduced into the supervised environment.

Maintaining Security:

- During supervised assessment sessions, the assessment areas must only be accessible to the individual learner and to named members of staff.
- Learners can only access their work under supervision.
- Any work learners produce under supervision must be kept secure.
- Only permitted materials for the set task can be brought into the supervised environment
- During any permitted break and at the end of the session materials must be kept securely and no items removed from the supervised environment
- Learners are not permitted to have access to the internet or other resources during the supervised assessment period.
- Learner notes related to Part A must be checked to ensure length and/or contents meet limitations.
- Learner notes will be retained securely by the centre after Part B and may be requested by Pearson if there is suspected malpractice.

After the session the teacher/tutor or invigilator will confirm that all learner work had been completed independently as part of the authentication submitted to Pearson.

Outcomes for Submission:

This task and answer booklet should be submitted to Pearson.

Each learner must complete an authentication sheet.

Instructions for Learners

Read the set task information carefully.

This session is of 2 hours. Plan your time carefully.

You have prepared for the set task given in this **Part B** booklet. Use your notes prepared during **Part A** if relevant. Attempt all of **Part B**.

Your notes must be your own work and will be retained by your centre until results are issued.

You will complete this set task under supervision and your work will be kept securely during any breaks taken.

You must work independently throughout the supervised assessment session and should not share your work with other learners.

Outcomes for Submission

You must complete the activities in this task booklet.

You must complete a declaration that the work you submit is your own.

Set Task

You have been asked to provide information to the manager and staff to help them to understand the breeding of their animals. Use your notes from any preparatory work completed in Part A.

Set Task Information

From Part A

Home Farm is a small, local farm park. The park operates as a visitor attraction and keeps livestock that appeals to families with young children. The park also operates as a working farm through the sale of livestock and their products.

You have been asked by the manager of Home Farm to provide information that can help both him and staff in conducting a sound approach to the breeding of animals in the park. The manager is specifically interested in breeding goats and needs more information about domestic goat breeds and their breed standards. The manager has highlighted the following breeds as of particular interest:

- Saanen
- Boer
- Golden Guernsey
- Alpine.

In your most recent conversation with the manager he indicated that he wanted to know about husbandry requirements, care planning, and mating/reproductive behaviours for these breeds.

Answer ALL questions. Write your answers in the spaces provided.

1 Goats have been kept as domestic animals for thousands of years, although many of the breeds kept today were developed much more recently, within the last few hundred years.

(a) Give **two** examples of selection pressures.

2 marks

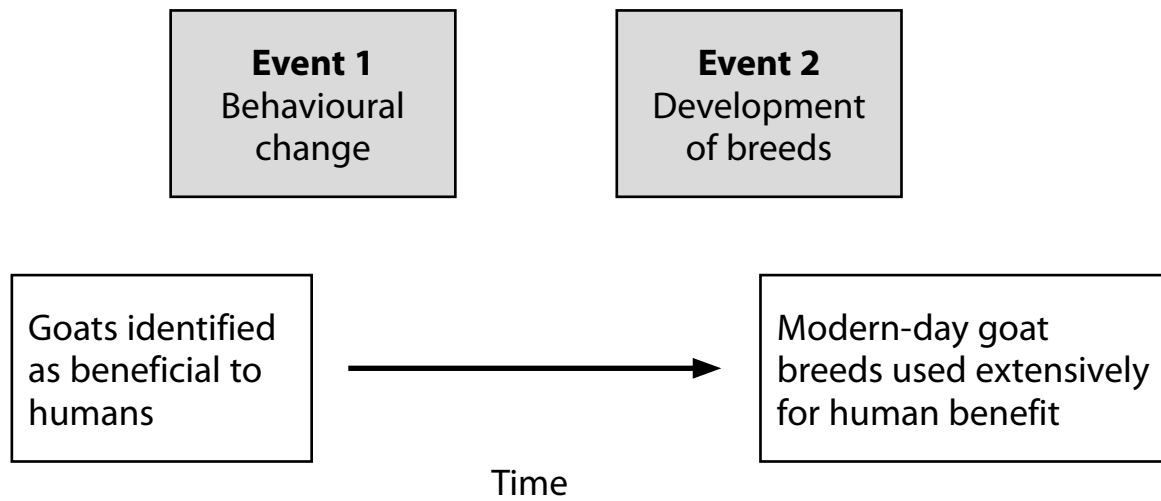
1

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The diagram below shows how goats have moved from being identified as beneficial to humans, to being used extensively for milking, pelts, meat and other by-products.



(b) For each of the events identified, explain how each has benefitted humans.

(i) Event 1: Behavioural change

2 marks

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(ii) Event 2: Development of breeds

2 marks

Four horizontal dotted lines for writing the answer.

Total for Question 1 = 6 marks

2

To breed goats successfully, the manager and staff need to understand how goats recognise and choose appropriate mates.

(a) Give **four** innate mating behaviours evident in goats.

4 marks

1

2

3

4

The manager wants to start a new milking herd. He will be buying his herd from an auction, so needs to initially assess a number of herds from a sale catalogue.

Here are extracts from the catalogues for three herds.

Picture 1: Herd of female Saanen Goats



(Source: By permission of Wood Farm)

Herd of 5 female Saanen goats, aged from 2yrs to 4yrs, excellent milkers, all had young. Vaccinated and wormed, not certified organic. These are a strong proven group of high milk yielders. All are in kid. Udders are healthy and no history of mastitis. One of the herd has recently damaged her eye on some fencing – vet has checked.

The herd lives on a diet of peas, corn, maize, lucerne and molasses, all dried into small pellets with ad libitum hay. There have been some individuals over the past 12 months with bloating issues.

Picture 2: Herd of mixed sex Boer goats



(Source: <http://www.clayfarmpartnership.com>)

Herd of 1 buck, proven fertility has sired many young, excellent animals
6 females, all with good colouration, unrelated to the buck and all have
carried kids, proven excellent mothers. A great starter group, excellent meat
produced from previous year's kids. Vaccinated but not wormed. All females
in kid.

Picture 3: Rare breed, Golden Guernsey



(Source: <http://lakedistrictwildlifepark.co.uk>)

Trio of females, rare breed young animals, 6–12 months of age, come from line of good milkers and are vaccinated and wormed. The smallest goat in the picture has developed conformational issues with its hind limb. As the name suggests, the goats are golden in colour, but the hues range from blond to deep bronze. They are very docile, smaller and more fine-boned than other British goats and their coat varies in length.

(b) Assess the suitability of these three herds and recommend a herd.
You should provide reasons for your choice.

Use your research notes and read all of the extracts carefully before making a recommendation.

12 marks

Area for writing the answer, consisting of a large rectangular box with horizontal dotted lines for writing.

Total for Question 2 = 16 marks

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3

The manager needs to define a breeding strategy for Alpine goats. The stud goats have various phenotypes in coat colour and ear size.

Stud 1

Genotype = ccee
Cou Clair, meaning "clear neck" is a recessive gene (Cc)
Short ears is a recessive gene (ee)



Stud 2

Genotype = Cc Ee
Cou Noir, meaning "black neck" is a dominant gene (Cc)
Medium ears is a dominant gene (Ee)



(Source: From: www.alpinesinternationalclub.com/breed_standard.html)

The manager wants to increase the number of animals with Cou Clair and medium-sized ears. The mating female has a genotype of Ccee. Work out the probability of offspring likely to be Cou Clair with medium sized-ears, when the female is crossed with each male.

(a) Calculate the phenotypic probabilities by using the dihybrid templates.

8 marks

Stud 1

Phenotypic probability

Stud 2

Phenotypic probability

(b) One of Gregor Mendel's laws of inheritance is the law of segregation.
Explain how this is applied in these crosses.

4 marks

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Total for Question 3 = 12 marks

4

The manager wants to maintain high standards of husbandry for his milking herd.

(a) Explain **three** considerations that the manager will need to take into account when creating a breeding plan for the milking herd.

6 marks

1

2

3

(b) Describe how the following nutritional requirements of the female should be monitored and adapted during the last six weeks of pregnancy.

- Energy requirements
- Protein requirements
- Forage requirements

6 marks

Energy requirements

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Protein requirements

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Forage requirements

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(c) Explain **two** neonate care strategies used within the first 48 hours.

4 marks

1

2

Total for Question 4 = 16 marks

5

One form of technology that can be used in breeding programmes is hormone therapy.

Describe how the following three uses of hormone therapy can be used in managing rare breeds:

- to induce early ovulation
- to induce parturition and stimulate milk flow
- as a method of contraception.

12 marks

To induce early ovulation

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To induce parturition and stimulate milk flow

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As a method of contraception

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Total for Question 5 = 12 marks

6

Home Farm is interested in keeping some rare breeds of goats. The manager is concerned that if the farm has too many rare breeds, they may have to deal with more genetic problems due to inbreeding and breeding-in of non-pedigree bloodlines.

- (a) Culling genetically “unhealthy” animals is one strategy used for maintaining a healthy pedigree in rare breeds.

Evaluate this strategy as a method of maintaining a healthy pedigree in rare breeds.

6 marks

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(b) Discuss why inbreeding may affect health and viability of breeding stock.

12 marks

Area for writing the answer, consisting of multiple horizontal dotted lines.

Total for Question 6 = 18 marks

END OF TASK

TOTAL FOR TASK = 80 MARKS

Unit 1: Animal Breeding and Genetics - Sample mark scheme

General Marking Guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Learners must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the learner's response is not worthy of credit according to the mark scheme.
- Where some judgment is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a learner's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the learner has replaced it with an alternative response.

Specific Marking Guidance for Levels Based Mark Schemes*

Levels based mark schemes (LBMS) have been designed to assess learner work holistically. They consist of two parts: indicative content, and levels based descriptors. Indicative content reflects specific content-related points that a learner might make. Levels based descriptors articulate the skills that a learner is likely to demonstrate in relation to the Assessment Outcomes being targeted by the question. Different rows within the levels represent the progression of these skills.

When using a levels-based mark scheme, the 'best fit' approach should be used.

- Examiners should first make a holistic judgement on which band most closely matches the learner response and place it within that band. Learners will be placed in the band that best describes their answer.
- The mark awarded within the band will be decided based on the quality of the answer in response to the assessment focus/outcome and will be modified according to how securely all bullet points are displayed at that band.
- Marks will be awarded towards the top or bottom of that band depending on how they have evidenced each of the descriptor bullet points.

Question number	Answer	Mark
1 (a)	<p>Any two selection pressures from:</p> <ul style="list-style-type: none"> • competition • environmental e.g. natural disasters, disease, survival rates, weather • poor or reduced gene pool • high predation • poor offspring rates • effects of human interference 	2 x 1 (2)
Question number	Answer	Mark
1 (b) (i)	<p>An answer that makes reference to:</p> <p>Event 1: Behavioural change</p> <ul style="list-style-type: none"> • Behaviour: Change from highly strung animal to much calmer animal (1), easier to handle / more accepting of humans (1) <p><i>or any other acceptable answer</i></p>	2 x 1 (2)
Question number	Answer	Mark
1 (b) (ii)	<p>An answer that makes reference to:</p> <p>Event 2: Development of Breeds</p> <ul style="list-style-type: none"> • Development of breeds: Development of distinctly different characteristics such as horns (1), so as easier to handle and pose less danger to humans (1) <p><i>or any other acceptable answer</i></p>	2 x 1 (2)

Question number	Answer	Mark
2 (a)	<p>Any four from:</p> <ul style="list-style-type: none"> • instinctive mounting of kids by other kids (1) • males detecting scent in urine and curling lips to detect heat status (1) • sexually mature males and females will establish a 'pecking order' in the herd (1) • environmental factors that impact breeding and behaviour e.g. temperature, photoperiod, rainfall (1) • mounting in adult animals (1) • primary and secondary sexual characteristics (1) <p style="text-align: right;">4 x 1</p>	(4)

Question Number	Indicative content	
2 (b)	<p>Answers will be credited according to the learner's demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <p>Answers will consider all the factors that need to be covered when assessing livestock for their suitability to breed including; body features and condition, animal's purpose, effectiveness in breeding, breed standards and meeting the aim of purchase.</p> <ul style="list-style-type: none"> • Factors affecting breeding considerations e.g. Mouth / Teeth, Eyes, Head shape/size, horns, coat colour, limbs, hooves, genitals posture and conformation • Breed standards • Desirable characteristics • Assessment of breeding stock for suitability • Recommendations on suitability 	
Mark scheme (Award up to 12 marks) Refer to the guidance on the cover of this document for how to apply Levels Based Mark Schemes*.		
Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-4	<p>Demonstrates isolated elements of knowledge and understanding presented in an unstructured format.</p> <p>Limited reference to relevant evidence linked to the assessment</p> <p>A recommendation may be presented, but will lack focus and be superficial and underdeveloped.</p>
Level 2	5-8	<p>Demonstrates mostly accurate knowledge and understanding. There is some structure to the response.</p> <p>The answer is mostly supported through the application of relevant evidence drawn from the assessment and wider research</p> <p>Recommendation will be mostly focused and developed and show some linkages and lines of reasoning.</p>
Level 3	9-12	<p>Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format.</p> <p>Answer is fully supported throughout by sustained application of relevant evidence drawn directly from the assessment and wider independent research</p> <p>Recommendation will be clear, concise and well developed showing comprehensive linkages and lines of reasoning.</p>

Question number	Answer	Mark																																
3 (a)	<p>For each dihybrid cross and phenotypic probability learners should be rewarded for:</p> <p>Stud 1</p> <ul style="list-style-type: none"> • breaking down the parent genotype (1) • completing the grid accurately (1) <p>See completed grid below for correct answers</p> <table border="1" data-bbox="327 582 1222 900"> <tr> <td colspan="2" rowspan="2"></td> <td colspan="4">Female genotype: Ccee</td> </tr> <tr> <td>Ce</td> <td>Ce</td> <td>ce</td> <td>ce</td> </tr> <tr> <td rowspan="2">Male 1 genotype:</td> <td>ce</td> <td>Ccee</td> <td>Ccee</td> <td>ccee</td> <td>ccee</td> </tr> <tr> <td>ce</td> <td>Ccee</td> <td>Ccee</td> <td>ccee</td> <td>ccee</td> </tr> <tr> <td rowspan="2">ccee</td> <td>ce</td> <td>Ccee</td> <td>Ccee</td> <td>ccee</td> <td>ccee</td> </tr> <tr> <td>ce</td> <td>Ccee</td> <td>Ccee</td> <td>ccee</td> <td>ccee</td> </tr> </table> <p style="text-align: right;">2 x 1</p> <p>Phenotypic probability:</p> <p>Award 1 mark for:</p> <ul style="list-style-type: none"> • working out the correct genotypic probabilities (1) • working out the correct numeric probability (1) <p>50% are heterozygous (Ccee) for cou noir and homozygous for short ears 50% are homozygous (ccee) for cou clair and homozygous for short ears</p> <p style="text-align: right;">2 x 1</p>			Female genotype: Ccee				Ce	Ce	ce	ce	Male 1 genotype:	ce	Ccee	Ccee	ccee	ccee	ce	Ccee	Ccee	ccee	ccee	ccee	ce	Ccee	Ccee	ccee	ccee	ce	Ccee	Ccee	ccee	ccee	cont.../
				Female genotype: Ccee																														
		Ce	Ce	ce	ce																													
Male 1 genotype:	ce	Ccee	Ccee	ccee	ccee																													
	ce	Ccee	Ccee	ccee	ccee																													
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	ce	Ccee	Ccee	ccee	ccee																													

3 (a) cont

Stud 2

Learners should be rewarded for:

- breaking down the parent genotype (1)
- completing the grid accurately (1)

See completed grid below for correct answers

		Female genotype: Ccee			
		Ce	Ce	ce	ce
Male 2 genotype: CcEe	CE	CCEe	CCEe	CcEe	CcEe
	CE	CCEe	CCEe	CcEe	CcEe
	cE	CcEe	CcEe	ccEe	ccEe
	cE	CcEe	CcEe	ccEe	ccEe

2 x 1

Phenotypic probability:

Award 1 mark for:

- working out the correct genotypic probabilities (1)
- working out the correct numeric probability (1)

25% homozygous for Cou Noir and Heterozygous for medium sized ears (CCEe)

50% heterozygous for both Cou Noir and medium sized ears (CcEe)

25% homozygous for cou clair and heterozygous for medium ears (ccEe)

2 x 1

(8)

Question number	Answer	Mark
3 (b)	<p>An answer that makes reference to:</p> <ul style="list-style-type: none"> • The law of segregation indicates that no two genes are expressed at the same time. (1) • In the crosses it clearly shows Cou Clair or Cou Noir and not a blend or an incomplete dominance. (1) • The ears are also either expressed as short or medium. (1) • Genes are separated according to the traits they apply. (1) <p style="text-align: right;">4 x 1</p>	(4)
Question number	Answer	Mark
4 (a)	<p>Award 1 mark for each consideration identified and 1 mark for a correct explanation of that consideration:</p> <ul style="list-style-type: none"> • udder health (1) good indicator of milk productivity and quality (1) • breeding productivity (1) females who are good mothers and have regular offspring are more likely to give a good milk yield • fertility status of the male (1) there should be a high sperm motility in significant numbers • oestrus cycle (1) understanding the patterns of oestrus will allow for high breeding productivity of females • gestation period (1) five month gestation allows for planning and preparation for husbandry requirements • feed intake (1) allowances in ration and budgets for an increased feed intake for females and their offspring <p><i>or any other acceptable answer</i></p> <p style="text-align: right;">3 x 2</p>	(6)

Question number	Answer	Mark
4 (b)	<p>Award up to 2 marks for each correct description of how requirements should be monitored/adapted:</p> <p>Energy requirements:</p> <ul style="list-style-type: none"> • current energy intake should be reviewed in relation to sources (1) and increased according to the needs of the animal (1) <p>Protein requirements:</p> <ul style="list-style-type: none"> • the animal's crude protein percentage intake should be reviewed (1) and increased or decreased accordingly (1) <p>Forage requirements:</p> <ul style="list-style-type: none"> • access to good quality forage such as hay / haylage, should be available ad libitum (1) and form the bulk of the animal's diet (1) <p><i>or any other acceptable answer</i></p> <p style="text-align: right;">3 x 2</p>	(6)
Question number	Answer	Mark
4 (c)	<p>Any two of the following:</p> <ul style="list-style-type: none"> • Dipping of the naval in iodine (1) to prevent bacterial infection (1) • Vaccination for diseases (1) which should be administered by approved methods to prevent disease (1) • Ensuring the offspring has accessed the mother's colostrum (1) to get the immunoglobulins needed for the immune system (1) • Ensuring airways are free of congestion (1) to allow for first breaths to be taken <p><i>or any other acceptable answer</i></p> <p style="text-align: right;">2 x 2</p>	(4)

Question number	Answer	Mark
5	<p>Award up to 4 marks for each correct description of how the hormone therapies can be used in the management of rare breeds:</p> <p>To induce early ovulation: Induced ovulation is when a female animal ovulates due to an externally derived stimulus during, or just prior, to mating, rather than ovulating cyclically or spontaneously (1). This can be achieved by in administration of hormones such as oxytocin (1). Stimuli causing induced ovulation include the physical act of coitus or mechanical stimulation simulating this, sperm and pheromones (1). In managing rare breeds this give a vital tool for breeders to increase reproductive receptivity in the animal (1).</p> <p style="text-align: right;">4x1</p> <p>To induce parturition and stimulate milk flow: By administering certain hormones, parturition (birthing) can be brought on in animals (1). This is typically done in the final days of pregnancy when the foetus is fully mature, although induction of parturition earlier (abortion) can also be undertaken (1). Abortion and inducement of parturition can be indicated for medical reasons, but are often employed for commercial purposes as well (1). The necessary hormone injections, such as oxytocin, should result in milk which should flow freely from the teat (1).</p> <p style="text-align: right;">4x1</p> <p>As a method of contraception: Managing unwanted births can be achieved through several ways including the hormone implant (1). In hooven animals, and ungulates, products with synthetic progesterone (progestin) are safe and effective, and reversal rates are high (1). Some changes in uterine fluid content have been documented during progestin treatment, but evidence indicates that it resolves after treatment ends (1). However, with repeated treatments with some hormones across many years, the period of infertility is extended and eventually may become permanent so would be a very effective method of contraception (1).</p> <p style="text-align: right;">4x1</p>	(12)

Question Number	Indicative content
6 (a)	<p>Answers will be credited according to the learner's demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <ul style="list-style-type: none"> • Challenges posed by culling in small populations e.g. reduction of gene pool • Removal / eradication of undesirable traits from populations e.g. diseases, disorders and unwanted characteristics • Meeting / not meeting breed standards • Improving genetic health – veterinary evaluation • Adherence to culling practices and policies • Waste disposal, costs • Moral and ethical considerations / public perception of organisation

		<ul style="list-style-type: none"> Alternatives e.g. relocation, castration and neutering
Mark scheme (Award up to 6 marks) Refer to the guidance on the cover of this document for how to apply Levels Based Mark Schemes*.		
Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-2	<p>Demonstrates isolated elements of knowledge and understanding presented in an unstructured format.</p> <p>Generic statements may be presented rather than linkages being made so that lines of reasoning are unclear or rarely supported through the application of relevant evidence from the context</p> <p>Displays a limited awareness of benefits or drawbacks leading to an evaluation that is superficial, focuses on only one element and therefore judgement is limited.</p>
Level 2	3-4	<p>Demonstrates mostly accurate knowledge and understanding. There is some structure to the response.</p> <p>Some occasional linkages present so that lines of reasoning are mostly clear and partially supported through the application of relevant evidence from the context.</p> <p>Displays an awareness of both benefits and drawbacks leading to an evaluation although there is an imbalance with one element more heavily present therefore judgement is partially developed.</p>
Level 3	5-6	<p>Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format.</p> <p>Comprehensive linkages evidenced so that lines of reasoning are clear and concise and well supported throughout by sustained application of relevant evidence from the context.</p> <p>Displays a thorough awareness of both benefits and drawbacks leading to a well-balanced evaluation therefore judgement is well developed.</p>

Question Number	Indicative content
6 (b)	<p>Answers will be credited according to the learner’s demonstration of knowledge and understanding of the material using the indicative content and levels descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.</p> <ul style="list-style-type: none"> • Inbreeding depression • Captive outbreeding / inbreeding • Genetic variation • Diseases and disorders • Management practices • Reduction in gene pools <p>Inbreeding can occur when a population becomes very small or isolated from new mates. In captivity, inappropriate management of males and females will likely lead to inbreeding, e.g. parents and siblings mating to produce inbred livestock. If allowed to continue to inbreed, poor health, diseases, and genetic disorders are much more likely to occur. This is due to reduced genetic variation and if continued the relation between population and genetic variation will widen leading to a collapse in the population.</p>

Mark scheme (Award up to 12 marks) Refer to the guidance on the cover of this document for how to apply Levels Based Mark Schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material
Level 1	1-4	<p>Demonstrates isolated elements of knowledge and understanding presented in an unstructured format.</p> <p>Generic statements may be presented rather than linkages being made so that lines of reasoning are unclear.</p> <p>Discussion is superficial rarely supported through the application of relevant evidence from the context</p>
Level 2	5-8	<p>Demonstrates mostly accurate knowledge and understanding. There is some structure to the response.</p> <p>Some occasional linkages present so that lines of reasoning are partially supported and mostly clear.</p> <p>Discussion is partially developed occasionally supported through the application of relevant evidence from the context</p>
Level 3	9-12	<p>Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format.</p> <p>Comprehensive linkages evidenced so that lines of reasoning are well supported, clear and concise.</p> <p>Displays a well-developed and logical discussion supported throughout by sustained application of relevant evidence from the context</p>

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