BTEC

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

First teaching from September 2016 Issue 3

Pearson

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Contents

Changes to task and rubrics

We have made changes in response to DfE feedback.

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

Summary of Pearson BTEC Level 3 National Extended Diploma in Animal Management Sample Assessment Materials for Unit 1: Animal Breeding and Genetics Issue 2 to 3 changes.

Part A – Summary of changes made between previous issues and this current issue	**Page number**
An introduction section has been added to clarify the: • purpose of the assessment • availability and timings of the assessment • requirements for monitored preparation and formal supervision.	Page 1
Wording in the Instructions to teachers/tutors section has been changed to reflect the changes in the Introduction section and clarify that: • the time for learners to undertake Part A has been changed from 6 to 3 hours • learners must now be monitored during the 3 hour preparation period in accordance with the new monitored preparation conditions • the number of A4 sheets learner may produce for use in Part B has been changed from 4 to 2.	Page 4
Wording in the Instructions for learners section have been changed to reflect the changes in the Introduction and Instructions to teachers/tutors sections.	Page 5
The Set task brief section has been changed to clarify what learners will need to research.	Page 6

Part B – summary of changes made between previous issues and this current issue	Page number
Set task section wording has been revised to reflect the changes in the Part A Set Task Brief section.	Page 9
Part A Set Task information section wording has been revised to reflect the changes in the Set Task section.	Page 10
Part B Set task information section wording has been revised to reflect the changes in the Set Task and Set Task information sections and clarify what learners will be assessed on.	Page 10
The stimulus material for Question 2 (b) has been changed for clarity and the command verb for the question has been changed from 'Assess' to 'Justify' to increase the rigour and validity of this question.	Page 15

Sample mark scheme – Summary of changes made between previous issues and this current issue	Page number
The Indicative Content for Question 2(b) has been changed to reflect the changes in the scenario and command verb for the question.	Page 29

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Introduction

Teachers/tutors are asked to read this section to understand the structure of the assessment for this unit as illustrated in this sample assessment. This information will not appear in the text of the live assessments.

The key purpose of this assessment is to enable learners to show how they can use research into industry standards and practice to complete extended written activities relating to breeding practices for a given species of animal.

This is a task in two parts. This assessment will be offered twice a year. The timing of the assessment is **3 hours** of monitored preparation before the **2-hour** supervised assessment session timetabled by Pearson.

The assessment evidence submitted to Pearson for **Part B** is written activities completed within a task and answer book.

The assessment evidence is produced under full formal supervision to ensure that learner work is authentic and that all learners have had the same assessment opportunity. The formal supervision takes place in a **2-hour** session timetabled by Pearson.

Formal supervision is the equivalent of examination conditions. Learners must work independently, cannot work with other learners, cannot talk about their work to other learners and will only be able to access the materials specified in the assessment.

Monitored preparation is provided when learners produce materials that are used in any formally supervised session, i.e. two sides of A4 notes as specified in the sample assessment. Monitored sessions are where learners are being directly observed. They may have, where specified, access to their own outcomes from preparation, access to the internet and use of appropriate resources. Learners are working independently and teachers/tutors will be able to authenticate that the outcomes for formal assessment meet the requirements and are authentic. At the end of the monitored preparation centres will retain the notes which will be provided to learners during the formal supervised assessment. After the assessment the notes will be retained by the centre and may be requested by Pearson during the marking process.

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
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** may be given to learners as soon as it is received so that learners can start the preparatory period in advance of the supervised assessment session.
- **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 the relevant series.
- **Part B** materials for the set task will be issued prior to the start of the supervised assessment period according to the guidance in the specification.

Paper reference
XXXX/XX
S50449A

1/1/1/1/1/1/1/1/1/1

S 5 0 4 4 9 A

PEARSON

Instructions to Teachers/Tutors

Centres should refer to the ICEA document for full information on the correct conduct of monitored and formally supervised assessment.

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 B contains unseen material and is issued to learners at the start of the formal supervised assessment session specified by Pearson.

For **Part A**, learners should be monitored over **3 hours** provided by the centre, to read **Part A**, carry out research and compile notes. During this time they may only have access to research materials including books, journals, the internet and notes from prior learning. Learners must work independently and must not be given guidance or feedback on the completion of the preparatory work. Learners must not prepare potential responses, and only notes produced in monitored sessions may be used during the formal assessment. Learners may produce up to two sides of A4 notes, which should be handwritten or typed in a 12pt font. Notes should be short, bullet-point style information, and cannot contain long narrative pieces of text.

Learner notes produced under monitored conditions must be checked by teachers/tutors to ensure that they comply with the limitations.

Learner notes should be retained by the centre between the monitored sessions and the formal supervised assessment.

Learner notes should be retained by the centre after the completion of the assessment and may be requested by Pearson.

Instructions for Learners

Read the set task information carefully.

Part A contains the information you need to prepare for the **Part B** set task.

You will be given **3 hours** of monitored preparation. Your tutor will advise you of the scheduled sessions for this work.

During these sessions you will prepare summary notes to support you during the supervised assessment. Your notes should:

- be individually and independently prepared by you
- contain a maximum of two sides of A4, either handwritten or typed in a 12pt font
- use short, bullet-point style information, and cannot contain long narrative pieces of text.

Your notes will be checked by your centre and retained after the completion of the formal supervised assessment.

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

Your teacher cannot give you feedback during the preparation period.

Set Task Brief

You are required to carry out research into industry standards and practice in relation to the captive breeding of:

- **goats.**

Pearson BTEC Level 3 Nationals

Write your name here

Surname	Forename

Learner Registration Number | Centre Number

Level 3

Animal Management

Unit 1: Animal Breeding and Genetics

Part B

Marks

Supervised hours 2

Extended Diploma
Sample assessment material for first teaching
September 2016

Instructions

- **Part A** will need to have been used in preparation for completion of **Part B**.
- **Part B** contains material for the completion of the set task under supervised conditions.
- **Part B** should be undertaken in one session timetabled by Pearson.
- **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 periods.

Information

- The total mark for this paper is 80.

Paper reference
XXXX/XX
S51043A

1/1/1/1/1/1/1/1/1/1

S 5 1 0 4 3 A

PEARSON

Instructions to Teachers/Tutors

This 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 period is conducted correctly and that learners have the opportunity to carry out the required activities independently.

Part B set task is undertaken under formal supervision in a single session of **2 hours** timetabled by Pearson.

Part B materials must be issued to learners for the specified session. Work should be completed in this task and answer booklet.

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 the notes comply with the requirements.

All learner work must be completed independently and authenticated by the teacher/tutor before being submitted to Pearson.

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

- 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 assessment.
- During any permitted break and at the end of the session, materials must be kept securely and no items removed from the supervised assessment.
- Learners are not permitted to have access to the internet or other resources during the supervised assessment period.

Outcomes for submission

A completed task and answer booklet.

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 period and should not share your work with other learners.

Outcomes for submission

Completed task and answer booklet.

Set Task

You must complete ALL the activities in this task booklet.

The activities in this task booklet relate to **Goats**.

END OF TASK

TOTAL FOR TASK = 80 MARKS

Part A Set Task Information

Goats

Part B Set Task Information

Home Farm is a small, local farm park. The manager is specifically interested in breeding goats for commercial use. They have asked you to provide information that can help them and the staff in conducting a sound approach to the breeding of animals in the park.

Use your notes from any preparatory work completed in **Part A**.

Task Booklet

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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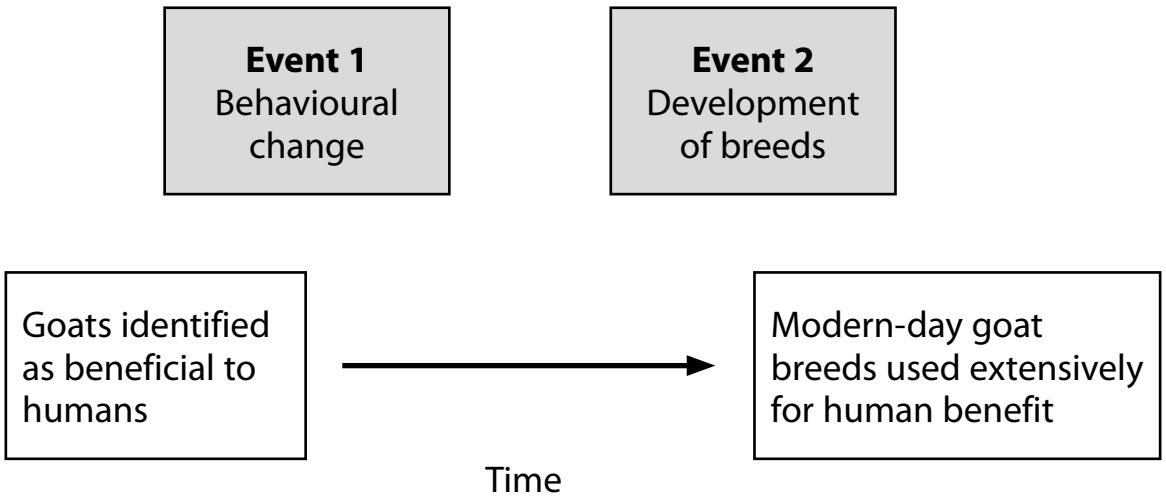
2 .....

.....

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

(ii) Event 2: Development of breeds

2 marks

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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 .....

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2 .....

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3 .....

.....

4 .....

(b)

To improve the economic success of the farm, the manager wants to diversify its business and has decided to purchase and breed a new milking herd of goats, using young stock. The manager has asked for your help in deciding what factors need to be considered before purchasing the herd.

You will need to take account of the following information.

- Home Farm is located in a mountainous region of the UK. Part of it has recently been opened to the public, where families can visit and interact with the animals.
- The manager has suggested that the farm would like to be able to enter the goats in shows.
- There are adequate facilities for housing the goats in the worst weather but the manager would prefer to turn them out in fields without constructing shelters. There is also suitable accommodation available to care for goats in kid.

Justify suitable options for Home Farm to achieve its aims, taking into account the desirable characteristics of a new herd.

12 marks

Total for Question 2 = 16 marks

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

Stud 1	**Stud 2**
Genotype = ccee Cou Clair, meaning "clear neck" is a recessive gene (Cc) Short ears is a recessive gene (ee)	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 being 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

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 .....

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2 .....

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3 .....

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(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

Protein requirements

Forage requirements

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

4 marks

1 .....

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.....

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2 .....

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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 the management of rare breeds:

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

12 marks

To induce early ovulation.

To induce parturition and stimulate milk flow.

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 the farm 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 to maintain a healthy pedigree in rare breeds.

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

6 marks

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

12 marks

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)	Any **two** selection pressures from: • competition • environmental, e.g. natural disasters, disease, survival rates, weather, breeding depression • 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)	An answer that makes reference to: Event 1: Behavioural change • Behaviour: Change from highly strung animal to much calmer animal (1) easier to handle / more accepting of humans. (1) *Or any other acceptable answer.*	**(2)**
Question number	**Answer**	**Mark**
1 b) ii)	An answer that makes reference to: Event 2: Development of Breeds • Development of breeds: Development of distinctly different characteristics such as horns (1) so as easier to handle and pose less danger to humans. (1) *Or any other acceptable answer.*	**(2)**
Question number	**Answer**	**Mark**
2 (a)	Any **four** from: • 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) 4 x 1	**(4)**

Question Number	Indicative content
2 (b)	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. Answers will consider all relevant desirable characteristics for the species and purpose including how these contribute to long-term success of the herd/group. Answers must be linked to/informed by information provided in the scenario. • Desirable characteristics such as anatomical features, colouration and markings, production factors and ability to meet targets, fertility and mating success, offspring quality, absence of genetic disorders and diseases, ease of handling, temperament, muscle definition and covering, good body condition score, ease of housing, suitability to environment, horns or none, positive breeding records and history, and any other acceptable answer. • Factors affecting breeding considerations, e.g. mouth / teeth, eyes, head shape/size, horns, coat colour, limbs, hooves, genitals, posture and conformation. • Specific breed standards and those identified by breed associations where relevant. • Justification of long-term success of species/ purpose

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	Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. Limited reference to relevant evidence linked to the assessment. A recommendation may be presented, but will lack focus and be superficial and underdeveloped.
Level 2	5-8	Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. The answer is mostly supported through the application of relevant evidence drawn from the assessment and wider research. Recommendation will be mostly focused and developed and show some linkages and lines of reasoning.
Level 3	9-12	Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. Answer is fully supported throughout by sustained application of relevant evidence drawn directly from the assessment and wider independent research. Recommendation will be clear, concise and well developed showing comprehensive linkages and lines of reasoning.

<table>
<tr><th>Question number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>3 (a)</td><td>For each dihybrid cross and phenotypic probability learners should be awarded marks for:
Stud 1
• breaking down the parent genotype (1)
• completing the grid accurately. (1)
See completed grid below for correct answers.
<table><tr><td colspan="2"></td><td colspan="4">Female genotype: Ccee</td></tr><tr><td colspan="2"></td><td>Ce</td><td>Ce</td><td>ce</td><td>ce</td></tr><tr><td rowspan="4">Male 1 genotype:

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><tr><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>2x1
Phenotypic probability
Award 1 mark for:
• working out the correct genotypic probabilities (1)
• working out the correct numeric probability. (1)
50% are heterozygous (Ccee) for Cou Noir and homozygous for short ears
50% are homozygous (ccee) for Cou Clair and homozygous for short ears
2x1</td><td>cont’d</td></tr>
</table>

<table>
<tr><th>Question number</th><th>Answer</th><th>Mark</th></tr>
<tr><td>3 (a)
cont'd</td><td>
Stud 2
Learners should be awarded marks for:

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

See completed grid below for correct answers.
<table>
<tr><td colspan="2"></td><td colspan="4">Female genotype: Ccee</td></tr>
<tr><td colspan="2"></td><td>Ce</td><td>Ce</td><td>ce</td><td>ce</td></tr>
<tr><td rowspan="4">Male 2 genotype: 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>
<tr><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>
2x1

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)
2x1
</td><td>(8)</td></tr>
</table>

Question number	Answer	Mark
3(b)	An answer that makes reference to: • 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) 4 x 1	**(4)**
Question number	**Answer**	**Mark**
4 (a)	Award 1 mark for each consideration identified and 1 mark for a correct explanation of that consideration. • 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 rations and budgets for an increased feed intake for females and their offspring. *Or any other acceptable answer.* 3 x 2	**(6)**

Question number	Answer	Mark
4(b)	Award up to 2 marks for each correct description of how requirements should be monitored/adapted. Energy requirements: • current energy intake should be reviewed in relation to sources (1) and increased according to the needs of the animal. (1) Protein requirements: • the animal's crude protein percentage intake should be reviewed (1) and increased or decreased accordingly. (1) Forage requirements: • access to good quality forage such as hay / haylage, should be available ad libertum (1) and form the bulk of the animal's diet. (1) *Or any other acceptable answer.* 3 x 2	**(6)**
Question number	**Answer**	**Mark**
4(c)	Any **two** of the following • 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. *Or any other acceptable answer.* 2 x 2	**(4)**

Question number	Answer	Mark
5	Award up to 4 marks for each correct description of how the hormone therapies can be used in the management of rare breeds. 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 an administration of hormones such as oxytocin (1). Stimuli causing induced ovulation include the physical act of coitus or mechanical stimulation of sperm and pheromones (1). In managing rare breeds, this give a vital tool for breeders to increase reproductive receptivity in the animal (1). 4x1 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 flowing freely from the teat (1). 4x1 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). 4x1	**(12)**

Question Number	Indicative content
6 (a)	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. • 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. • 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	Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. 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. 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.
Level 2	3-4	Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. Some occasional linkages present so that lines of reasoning are mostly clear and partially supported through the application of relevant evidence from the context. 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.
Level 3	5-6	Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. 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. Displays a thorough awareness of both benefits and drawbacks leading to a well-balanced evaluation therefore judgement is well developed.

Question Number	Indicative content
6 (b)	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. • Inbreeding depression • Captive outbreeding/inbreeding • Genetic variation • Diseases and disorders • Management practices • Reduction in gene pools 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.

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	Demonstrates isolated elements of knowledge and understanding presented in an unstructured format. Generic statements may be presented rather than linkages being made so that lines of reasoning are unclear. Discussion is superficial rarely supported through the application of relevant evidence from the context
Level 2	5-8	Demonstrates mostly accurate knowledge and understanding. There is some structure to the response. Some occasional linkages present so that lines of reasoning are partially supported and mostly clear. Discussion is partially developed occasionally supported through the application of relevant evidence from the context.
Level 3	9-12	Demonstrates accurate and thorough knowledge and understanding presented in a clear and logical format. Comprehensive linkages evidenced so that lines of reasoning are well supported, clear and concise. Displays a well-developed and logical discussion supported throughout by sustained application of relevant evidence from the context.

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