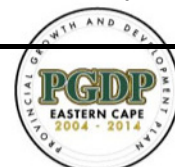


### NSC 2016 CHIEF MARKER'S REPORT

<b>SUBJECT</b>	AGRICULTURAL SCIENCES		
<b>PAPER</b>	ONE		
<b>DATE OF EXAMINATION:</b>	18 NOVEMBER 2016	<b>DURATION:</b>	2Hrs 30 Minutes

#### **SECTION 1: (General overview of Learner Performance in the question paper as a whole)**

- Generally learners' performance in Agricultural Sciences Paper One has dropped this year compared to that of previous years. There is a substantial number of candidates who have performed at 55.4% in level 1 and 25.7% in level 2 compared to 44.5% and 24.6% respectively. The quality of passes has also been negatively affected by the gradual downward shift of levels as observed in levels 5, 6 and 7.
- Many learners are achieving between levels 1 and 3 with the majority settling at level 3. Unlike other years, this year there were two candidates who scored an overall mark of zero, and a number of those scoring below ten marks. Candidates scored better marks in Question 1 compared to all other questions.  
The lowest score in the paper recorded was 0 and the highest 126 out of 150 marks, this culminated to 44.6% average performance in Paper One November 2016 compared to 55.7% in 2015.
- The drop in performance can be attributed to a number of factors including too much reliance on previous question papers, lack of content knowledge, inability to apply theory learnt in class to farming situations, failure by schools to implement modularization, and increased number of progressed learners in the subject.  
The paper assessed content knowledge learnt in class by providing different agricultural contexts before candidates to test different skills and an extent to which they can apply those in solving farming related challenges, unfortunately many candidates displayed lack of these skills.
- The most problematic questions to the majority of candidates were questions 2 and 3. The 2016 candidates performed at 50.8% in question 4 (animal reproduction) as analysed in the ranch scale than previous years. Teacher's efforts in preparing, engaging and drilling candidates on various approaches to grasp concepts and terminology of the subject need to be acknowledged hence the improvement in Questions 1 and 4. This means that there is still a lot to be done to improve the pass quantity and quality, so as to enable candidates to meet university entrance requirements by engaging them on reasoning and application type of questions.



## SECTION 2: Comment on candidates' performance in individual questions

(It is expected that a comment will be provided for each question on a separate sheet).

### QUESTION 1

- (a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Average mark from the sample of 100 :		74
SUB-QUESTION	TOPIC OR ASPECT TESTED	AVERAGE % FROM SAMPLE
1.1 – 1.4	<ul style="list-style-type: none"><li>• Animal Nutrition</li><li>• Animal Production Protection and Control</li><li>• Animal Reproduction</li></ul>	52.9%

- (b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- Sub-question 1.3.2 was a straight forward question, however candidates lost marks due to the inability to differentiate between a 2- host and a secondary / intermediate host. A 2-host is referring to a cycle and a secondary host is the organism in the cycle.
- Candidate performance in sub-question 1.3.4 were assisted by the inclusion of cloning as an alternative answer, however the general performance of 60% in this sub-question was obtained.
- Sub-question 1.4 was poorly performed at about 40% with most learners experiencing challenge in 1.4.1, 1.4.4 and 1.4.5.
- In sub-question 1.4.1 candidates could not correctly identify the Feed Conversion Ratio (FCR), responses like Fodder flow, Feed conversion, Maintenance ratio were mostly written, while in 1.4.4 candidates wrote gestation instead of dry. Vaginal prolapse as a correct response in sub-question 1.4.5 was obtained by very few candidates which clearly indicated that concepts are a challenge across most learners.

- (c) Provide suggestions for improvement in relation to Teaching and Learning

- Learners should be taught step by step process of cloning and definition of concepts involved in each step for example enucleation, donor, superior cow, clone.
- Educators should also develop interesting games when teaching terminology using cards, charts and PowerPoint presentations, which can also improve their spelling competency.
- Educators should guide the candidates on how to use past question papers so that they don't just take the answers but read the whole question with understanding and then respond accordingly.

**(d) Describe any other specific observations relating to responses of learners**

Candidates are still not responding to instructions:

- Sub-question 1.2 required learners to WRITE, A only, B Only, Both A and B or None instead they crossed using the answer sheet which resulted into loss of marks as this instruction was not accommodated in the answer book.
- Some candidates did NOT write the Only which is an assessment policy requirement for Paper 1

**(e) Any other comments useful to teachers, subject advisors, teacher development etc.**

Teachers MUST use the CAPS Document and Assessment guidelines when teaching and assessing formally and informally.

**QUESTION 2**

**(b) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

<b>Average mark from the sample of 100 :</b>		<b>17</b>
SUB-QUESTION	TOPIC OR ASPECT TESTED	AVERAGE % FROM SAMPLE
2.1 – 2.5	Animal Nutrition	47.4%

Question 2 was generally fair to candidates with scores ranging from 1-31 marks.

**(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

- Candidates did lose marks in 2.1 because they were unable to link the reason for the answer to 2.1.1 (Farm animal 2) with the structure of the stomach that mainly describes the non-ruminant, instead they were referring to the organs of the alimentary canal of a fowl for example crop, gizzard, caeca.
- In sub-question 2.1.3 learners correctly identified the feed constituting the greatest percentage of the ration for the ruminant (roughage) but failed to provide the reason for feeding roughage to a ruminant, instead they wrote functions of roughage and its characteristics which were not talking to the question for example, it is bulky.
- The inability to adhere to instructions was once again evident in sub-question 2.1.5 where candidates could not write the LETTER of the part that enable farm animal 1 to digest roughage.
- Sub-question 2.1.6 required explanation of how part D (crop) and E (proventriculus) in Farm animal 2 assist in the digestion of grain feed, candidates wrote that crop stores the feed which is not related to digestion of feed instead of softening and moistening the feed as the correct response.
- The performance of learners in sub-question 2.2
- In 2.2.1 learners identified the answer to B as excretion and yet excretion includes a number of metabolic reactions such as sweat and urination.
- In 2.2.3 learners were unable to present the formula for Digestible energy in a scientific form:  $DE = GE - \text{Energy lost in faeces}$  instead they wrote  $GE - \text{Energy lost in faeces}$  as a result they lost marks.
- The importance of net energy to livestock was required in sub-question 2.2.4, most learners wrote production, reproduction, work, growth. These constitute 1 mark as they all refer to production. Some wrote energy and were literally repeating the

question.

- Learners were expected to respond to what determines the biological value of lucerne compared to barley in question 2.3.2 instead they wrote that lucerne has high biological value than barley which was a repetition of the question.
- Learner performed poorly in question 2.4, they could not analyse the data in order to answer the question asked, some did not show all calculations as per instruction as a result they only obtained 2 out of 3 marks, 8.6% of candidates managed to obtain a full mark in sub-question 2.4.2, analysis of data for example the tons per hectare, number of months during which the feed was available and number of hectares in the farm as well as conversion of tons to kg were the greatest challenge.
- Learners could not refer the calculated value in 2.4.2 to the identified feed flow problem in sub-question 2.4.3 for example they were writing shortage of feed.
- In sub-question 2.4.4 learners displayed lack of understanding of sustainability and the concept of fodder flow in animal production. They could not give the sustainable action the farmer needs to take to address shortage instead they were writing providing supplementary feeding or buying which are not sustainable measures.

2.5

- Learners obtained an average of 53.6% in this sub-question, however most learners lacked the mathematical skills of calculating a kg from the percentage given. Some calculated the maize meal kg using the values of the sunflower oilcake meal as a result their responses affected the performance in the subsequent question 2.5.2. The challenge of placement of feed in the mixed ratio could not be understood by many learners, a feed rich in protein should have a lesser value in the ratio to give the desired DP otherwise a higher value of a protein rich feed in the ratio will exceed the required DP and will be expensive to the farmer.

**(c) Provide suggestions for improvement in relation to Teaching and Learning**

- Teachers should emphasise the concept of Biological Value during teaching and refer mostly to the purpose of nutrients composed in each feed
- Candidates should be given enough informal tasks to train them on tackling data response questions, and terminology journals should be developed for each topic to improve and expand learners' understanding of the subject terminology as well as their vocabulary.
- Learners should be exposed to other forms of reading materials other than textbooks e.g. internet, PowerPoint presentations on different topics especially for the topics like
- Learners need to be exposed to various activities including various calculations during their informal activities.

**(d) Describe any other specific observations relating to responses of learners**

- Teachers are advised to promote reading and analysis of text and should discourage memorisation without understanding the concepts.
- Teachers should focus on all aspects of the content that are listed in the CAPS document and Examination Guidelines.
- Educators should remember that there might be topics that have not been covered in recent question papers, but they still remain important content topics to be taught.

**(e) Any other comments useful to teachers, subject advisors, teacher development etc.**

- Teachers should guide the learners on how to process data using different approaches (tables and graphs, calculations etc.) especially fodder flow programme.
- Candidates should be able to link the data given to the content that they have been taught in class even before they work on the questions that are put before them.
- Candidates have a tendency of memorizing instead of reading with understanding hence they fail to apply the knowledge they have learnt. Teachers need to place more emphasis on making the learners understand the concepts instead of just memorizing them by assessing them the way national papers are structured.

**QUESTION 3**

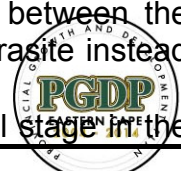
**(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

<b>Average mark from the sample of 100 :</b>		<b>17</b>
SUB-QUESTION	TOPIC OR ASPECT TESTED	AVERAGE % FROM SAMPLE
3.1 – 3.6	<ul style="list-style-type: none"><li>• Animal Production</li><li>• Animal Protection and Control.</li></ul>	47%

The general performance of candidates in this question was 47%. The section on Animal health contributed most to this poor performance.

**(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

- On average 69.6% candidates performed well in sub-question 3.1.1.
- Most learners were able to draw the graph, aspects such as the type of graph, heading with both variables, indication of units, however scaling is still a challenge which affects the correct plotting of the graph. Some candidates struggled to differentiate between dependent and independent variables as a result they could not provide a correct trend for the graph drawn in the subsequent question.
- Questions 3.2 and 3.3 required in-depth understanding of Animal production and handling with more emphasis on tool and facilities utilised by farmers.
- In sub-question 3.2.1 candidates were unable to correctly identify the tool (elastator) in the picture which led to loss of 4 full marks in related subsequent questions.
- Learners could not identify a facility to direct farm animal towards the loading ramp (crush) in sub-question 3.3.1 as a result they were unable to know the measures to consider when constructing the crush.
- Learners confused the measures to design the crush and the precautionary measures to reduce stress when transporting farm animals. They further did not differentiate between precautionary measures to reduce stress when transporting farm animals and the general factors to consider when transporting farm animals.
- In sub-question 3.3.3 learners failed to identify the permit as the document needed to transport farm animals although it was in the scenario instead they wrote Identity document or Letter from the chief or Licence.
- Generally learners have poorly performed in Animal health and Protection:
- Learners responses in sub-question 3.4.1 indicated misunderstanding between the name of a parasite and the type of a parasite, some wrote external parasite instead of blowfly, others wrote bluefly and others fly.
- In sub-section 3.4.2 and 3.4.3 learners responses of pupa as a harmful stage in the





life cycle of a blowfly instead of larvae/maggots as well as the condition of the larval stage respectively, clearly indicated the level at which life cycles of external parasites are not taught and assessed properly in the classroom.

- Sub-question 3.4.5 learners were expected to write the NON-CHEMICAL management practices to control blowfly infestation. Many candidates lost marks because they wrote any management practice to control infestation which indicated that learners are lacking the skill to identify the main phrase in a question, in this case NON-CHEMICAL.
- In sub-question 3.5 candidates did understand that overgrazed camps can be controlled through rotational grazing, however they displayed the inability to apply their knowledge to other agricultural situations for example 3.5.1 required learners to identify the control measure a farmer may take to prevent plant poisoning in animals grazing after being transported over long distances. A number of candidate responses did not refer to when the animals should be fed.
- The sub-question 3.6.1 required the identification of the pathogen causing both H1N1 and swine fever, many learners could not specifically write a pathogen instead they wrote viral disease, some type A influenza virus fortunately the marking guidelines catered for them too.
- Subsequently learners were unable to provide the role of state in controlling the spread of diseases as requested in sub-question 3.6.3, their responses mostly related to vaccination, injection, treatment, medicine which resulted into 1 mark.
- They also displayed misunderstanding of the relationship between isolation and quarantine

#### **(c) Provide suggestions for improvement in relation to Teaching and Learning**

- Educators should emphasise on the differentiation of variables, exercise learners through questioning the question statement in order to identify the variable that influences the other making it to be dependent and place it on the correct axis.
- Teach learners how to create scale at equal intervals (for example multiples of 5 or 10 or 20, etc.) to accommodate the data in question.
- Teachers should access on internet, periodicals and magazines the tools, apparatus and equipment used in animal production and project them for the learners to be able to identify the name of the tool, its management practise (use) and the reason for its use.
- Learners should be exposed to different facilities for handling farm animals through excursions, videos, prepared lessons on PowerPoint slides with pictures and visits to animal handling programs organised by extension officers in the Department of Agriculture.
- The performance of learners in 3.3.3 requires teachers to teach learners how to analyse and identify responses from scenarios.

#### **(d) Describe any other specific observations relating to responses of learners**

- Learners do not read the entire question, and this leads to them losing out on many marks.
- Teachers do spot teaching emphasizing content familiar to them and examination.

**(e) Any other comments useful to teachers, subject advisors, teacher development etc.**

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**QUESTION 4**

- (a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

<b>Average mark from the sample of 100 :</b>		<b>18</b>
<b>SUB-QUESTION</b>	<b>TOPIC OR ASPECT TESTED</b>	<b>AVERAGE % FROM SAMPLE</b>
	Animal reproduction	50.8%

- (b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**

- In the light of the commendable performance generally in the question, challenges were experienced in sub-question 4.1.1 where learners could not correctly write the units of semen concentration of dairy cattle hence they wrote 6 ml instead of 6million/ml. Number of sperm cells (in millions) was confused with the volume of semen (in ml).
- In sub-question 4.1.2 many learners managed to score the total mark of 4, however others were unable to comply with the principles of comparison, they included reasons for the semen volume or semen concentration, others even included the beef cattle which was not part of the question as a result they forfeited all or some of the marks.
- Learners managed to score marks in sub-question 4.2.1 (a) and (b) where the understanding of quality semen in relation to its colour was required, however freshness of blood in semen was confused with injuries, some were guessing the presence of infection in the red and grey colour of semen in animals, while others confidently associated grey colour with normal semen quality.
- In 4.2.2 responses of learners on the negative effects on the quality of semen included amongst others, the storage of semen and experience of the inseminator which relate to handling of semen.
- Question 4.3.1 was one of the questions where learners scored the total marks however differentiation between embryo transplantation and cloning still posed a challenge.



- Learners could not analyse the question correctly as a result some wrote oestrus cycle instead of oestrus as a stage of oestrus cycle, others indicated heat which is a characteristic of oestrus as a stage in the cycle.
- Sub-question 4.3.3 was a higher order question which posed a great challenge to teachers as well as top performers to the extent that about 18% of learners managed to score at least 2 marks. The main aspect was to understand the importance of correct timing of ovulation for successful insemination.
- The performance of learners in 4.4 was not as poor however challenges were evident in aspects such as, correct identification of the types of twins, some learners referred to non-identical twins as freemartin, others wrote homologous instead of monozygous twins.
- They could not correctly motivate and include the main aspect of fertilisation of an ovum which was required for a correct response. Some learners wrote fertilisation of the ovary confusing it to an ovum.

**(c) Provide suggestions for improvement in relation to Teaching and Learning**

- Standardised formal tasks should be prepared in order to raise the level of questioning and to train learners to be ready in answering questions such as those in question 4 that need reasoning and application.
- Animal reproduction section should be taught using diagrams and charts or projection of ASAAE slides for enrichment and enhancement.
- Subject terminology is of utmost importance and needs to be taught, assessed and revised.

**(d) Describe any other specific observations relating to responses of learners**

- Lack of interpretation skill when it comes to graphs. Lack of scientific language when expressing themselves.
- Lack of understanding of processes, terms and concepts involved in reproduction such ET; AI; cloning; ovulation etc.

**(e) Any other comments useful to teachers, subject advisors, teacher development etc.**

- Subject terminology must be taught and assessed.
- Teachers must source charts and or slides of the different processes to give visual emphasis and clearer picture of the stages and the content.