WOMEN'S UNIVERSITY IN AFRICA

Addressing gender disparity and fostering equity in University Education

FACULTY OF AGRICULTURAL SCIENCES

MSc. DEGREE IN LIVESTOCK SCIENCE AND MEAT TECHNOLOGY

MAIN PAPER

MSc:	**ANIMAL PHYSIOLOGY AND SUSTAINABILITY (MLMT124)**
INTAKE:	**FIRST YEAR SECOND SEMESTER**
DATE:	**TIME: 3 HOURS**

INSTRUCTIONS TO CANDIDATES

Answer any four questions. Each question carries 25 marks.

1. a. Describe and give the physiological basis for the hormonal control of oestrus [13]

   b. Name two structures responsible for holding the bovine mammary gland in place [2]

   c. Outline two factors essential for the maintenance of lactation [2]

   d. Explain the physiological basis for one of the factors requested in 4(C) above [8]

2. Describe and explain the following terms;

   i. Compensators and regulators [5]

   ii. Two classes of organisms based on temperature requirements [5]

   iii. The thermoneutral zone (TNZ) [5]

   iv. Aestivation [5]

   v. The rationale behind evaporative cooling [5]

3. Review, with reference to specific examples, the climatic requirements of various livestock species [25]

4. a. State two sources of fatty acids for milk fat synthesis in mammals [2]

   b. Which class of livestock is associated with biohydrogenation of fat acids? [1]

   c. Define the term biohydrogenation [2]

   d. Name any 3 factors that could lead to anoestrous [3]

   e. Briefly describe the process of folliculogenesis in the ewe [17]

5. **Table 1** shows Least Square Means (LSM) recorded in a study on time spent on common activities by 3 strains of slow-growing chickens. Additional data for this study is that a Temperature Humidity Index (THI) was computed for the study period, from Relative humidity and ambient temperature. Based on this and the data in Table 1, describe and offer plausible explanations for the results recorded in this study. **[25]**

Table 1. Least square means (LSM) for time spent on different activities by Potchefstroom Koekoek (PK), Ovambo (OV) and Naked Neck (NN) chickens

Effects		n[1]	Time spent on activity (s)					
			Foraging	**Standing**	**Drinking water**	**Preening**	**Dust-bathing**	**Walking**
Strain	NN[2]	36	265.4 ± 28.00	136.9 ± 19.37	25.6 ± 8.88	74.4 ± 17.83	42.5 ± 21.77	77.1 ± 8.29
	OV[3]	36	297.1 ± 28.91	140.8 ± 19.37	43.7 ± 10.27	41.6 ± 18.10	54.6 ± 26.06	46.1 ± 8.29
	PK[4]	36	252.9 ± 28.91	152.7 ± 19.66	35.8 ± 10.27	88.07 ± 18.70	42.6 ± 29.17	69.6 ± 8.41
P value			0.3314	0.8821	0.4083	0.1459	0.9241	0.0255
Sex	Male	36	230.4 ± 23.95	176.2 ± 15.81	28.3 ± 8.09	54.9 ± 14.71	53.8 ± 21.44	81.7 ± 6.77
	Female	36	313.3 ± 22.86	110.7 ± 15.97	41.8 ± 7.96	81.1 ± 15.03	39.3 ± 20.90	46.7 ± 6.83
P value			0.0197	0.0052	0.1673	0.2096	0.5977	0.0004
Week	1	36	187.8 ± 29.98	207.0 ± 19.66	48.7 ± 12.38	101.3 ± 19.0	54.4 ± 38.14	69.9 ± 8.41
	3	36	364.7 ± 28.00	67.7 ± 19.37	20.6 ± 8.75	45.5 ± 17.83	36.1 ± 21.05	65.8 ± 8.29
	5	36	263.0 ± 28.00	155.8 ± 19.37	35.8 ± 8.75	57.2 ± 17.83	49.2 ± 21.05	57.0 ± 8.29
P value			0.0002	0.0001	0.1642	0.0866	0.8725	0.5369

[1]Number of observations, [2]Naked Neck, [3]Ovambo, [4]Potchefstroom Koeokek

Adapted from: **Mutibvu T., Chimonyo M and Halimani TE. 2017. Effects of strain and sex on the behaviour of free-range slow-growing chickens raised in a hot environment. Journal of Applied Animal Research. http://dx.doi.org/10.1080/09712119.2017.1287079**

6. One of the major ways of ensuring successful and sustainable rearing of livestock is investing in adaptable breeds of livestock. Choose ONE meat type species and give a detailed description of its adaptive attributes to rearing in its common environment in Zimbabwe [25]