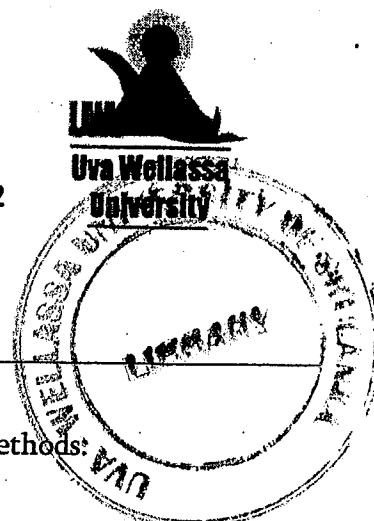


Uva Wellassa University
Faculty of Animal Science and Export Agriculture
End Semester Examination- September/October, 2012
Year III Semester II
AAS 301-3 Applied Statistics for Agriculture



1.
 - I. Give a brief explanation of the need of nonparametric statistical methods:
 - II. An aquaculturist wanted to compare the growth of two types of tilapia after rearing together in 10 tanks. The initial weights were similar in two types. After rearing 120 days with 3% weight of feeding, final mean weights were obtained, as shown in table 02.

Table 02: Final Mean Weights (g)

Tank No	1	2	3	4	5	6	7	8	9	10
Nile Tilapia	121	119	119	125	117	121	123	126	127	119
Red Tilapia	116	120	115	123	113	124	118	120	122	113

In order to test whether there is a difference in mean final weights (g) between two types of tilapia, the Wilcoxon's match pairs sign test was performed. The Minitab output of the test is given below.

	N	Wilcoxon Statistic	P	Estimated Median
Difference	10	51.0	0.019	4.000

- a) Develop hypotheses that can be used to determine whether there is a difference in mean final weights (g) between two types of tilapia.
- b) Using the given Minitab output, test the above hypotheses and state your conclusion. ($\alpha=0.05$)
- c) What would be the alternative parametric test for Wilcoxon's match pairs sign test?

[20 marks]

2. The mass of tea in "Ceylonta" tea bags has a normal distribution with mean 4.1g and standard deviation 0.12g. The mass of tea in "Lipton" tea bags has a normal distribution with mean 4.2 and standard deviation 0.15g.

- Find the probability that a randomly chosen "Ceylonta" tea bag contains more than 4.0g of tea.
- Find the probability that a randomly chosen "Lipton" tea bag contains more than 4.0g of tea.

[10 marks]

3. An experiment was conducted to investigate the effect of three different diets on daily gains (g) in pigs. The diets are denoted with TR₁, TR₂ and TR₃. Five pigs were fed each diet (replicates). Proposed experimental design was Complete Randomized Design (CRD).

- Explain the randomization procedure which was used in the above experimental design.
- Write down the Statistical model for CRD.
- Using the ANOVA table given below, test the effectiveness of pig diets. ($\alpha=0.05$)

Table 03: ANOVA table

Source	DF	SS	MS	F
Treatment	2	3640	1820.00	6.13
Residual Error	12	3560	296.67	
Total	14	7200		

[15 marks]