

APPENDIXS

APPENDIX I: ANALYTICAL METHODS IN THE LABORATORY

1. Proximate analysis

Methods of (AOAC, 1990)

1.1 Dry matter (DM)

The sample was dried by oven drying for moisture evaporates. DM was determined gravimetrically as the residue remaining after drying.

Methods:

1. The weighted bottles were dried at 100°C for 12 hour in air oven and cool in desiccators.
2. Weight pre-dried bottle (W_a).
3. Add 3 g of sample (weighted to the nearest 0.01 g) (W_s) and distributed uniformly.
4. Dry sample to a constant weight at 100 °C for 12 h.
5. Remove bottle with sample after drying and place in desiccators to cool.
6. Weight the samples after cooling (W_b).
7. The dry matter was calculated as follows:

$$\% \text{ DM} = \frac{W_b - W_a}{W_s} \times 100$$

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1.2 Ash

Ash was determined by oxidizing all organic matter in a weighed sample of the material by incineration and determining the weight of the ash remaining.

Methods:

- 1 The porcelain crucibles were ignited in a muffle furnace at around 450 – 550 °C for overnight, then cool in a desiccators and weight after reaching room temperature (W_a).
- 2 The approximately 3 g of sample was weighted (W_s) into the pre-ignited crucible.
- 3 The crucibles with sample were placed on the hitted to removed smoke. After removing smoke, the crucibles with sample were placed in the cooled muffle furnace.
- 4 The crucibles with sample were ignited for 12 -18 h with 450 – 550 °C.
- 5 The muffle furnace was turn off and open after temperature has reached reducing about 250 °C.
- 6 The crucibles were transferred to the desiccator by using tong, then cool in the desiccator and weight after reaching room temperature (W_b).
- 7 The ash was calculated as follows:

$$\% \text{ Ash} = \frac{W_b - W_a}{W_s} \times 100$$

1.3 Crude protein (CP)

Crude protein was assayed by Kjeldahl method (the official method). The protein and other organic substances were digested with concentrated sulfuric acid in the presence of selenium reagent mixture as catalyst. The present nitrogen was converted into ammonium sulfate ($(\text{NH}_3)_2\text{SO}_4$). NaOH was added to release NH_3 which was distilled, collected in boric acid solution and quantitated by a titration method.

Reagents preparation:

Sulfuric acid, selenium reagent mixture, sodium hydroxide solution, tashiro indicator, 40% boric acid solution, hydrochloric acid standard solution, 0.1000 N

Methods:

- 1 The sample (1 g) was transferred into a Kjeldahl tube.
- 2 Added selenium reagent mixture (0.5 g) and mixed thoroughly.
- 3 Added H₂SO₄ (20 ml) rinse anything in neck of flask down into bulb.
- 4 Distillation: Place to Kjeldahl tubes in block digestion unit. At the end of digestion, digestion should be closer and free of undigested material. Cool the digestion to room temperature; added 30 ml H₂O to each tube and mix.
- 5 Distillation: Place to Kjeldahl tubes in block digestion unit. Added boric acid (25 ml) solution with indicator to Erlenmeyer flask (250 ml). Place on receiving platform with tube from condenser extending below surface of boric acid solution. At the end of distillation, distillate should be light green solution.
- 6 Titration: Titrate boric acid receiving solution with standard 0.1000 N HCl solution to first trace of pink. Lighted stir may aid visualization of end point.
- 7 Total of nitrogen was calculated as follows:

$$1.40 \times (\text{ml HCl; sample} - \text{ml HCl; blank}) \times \text{Normality HCl}$$

$$\% \text{ Total of Nitrogen} = \frac{\text{g; sample}}{\text{Total weight of sample}} \times 100$$

The percent protein was calculated on total nitrogen basis; multiply percent nitrogen with factor 6.25.

1.4 Crude fiber (CF)

Crude fiber is loss on ignition of dried residue remaining after digestion of sample with 3.125% H₂SO₄ and 3.125 NaOH solution under specific conditions. Method is applicable to grains, meals, flours, feeds and fiber-bearing materials from which fat can be extracted to leave workable residue.

Reagents preparation:

3.125% H₂SO₄ and 3.125% NaOH solution

Methods:

- 1 The sample (3 g; W_S) was transferred to 600 ml beaker and added 200 ml of 3.125% H₂SO₄ into the beaker.
- 2 The sample in the beaker was placed on digestion apparatus with pleadjusted hot plate and boil exactly for 10 min.
- 3 The sample in the beaker was removed and filtered through Buchner funnel with filter paper (whatman no 41) covered with diatomaceous earth.
- 4 The sample was rinsed with boiling distilled water (300 ml; divided into three times with 100 ml/time) through Buchner.
- 5 The all of diatomaceous earth and residue were returned into 600 ml beaker and added 200 ml of 3.125% NaOH into the beaker.
- 6 The sample in the beaker was boiled for 10 min.
- 7 The sample in the beaker was removed and filtered through porcelain crucible.
- 8 The residue sample was dried for constant weight at 100 °C for 12 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_a)
- 9 The residue sample in the crucible was ignited at 550 °C for 6 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_b)
- 10 Crude fiber was calculated as follows:

$$\% \text{ CF} = \frac{W_a - W_b}{W_S} \times 100$$

1.5 Ether extract (EE)

Fat was extracted from a dry sample with petroleum ether by using special Soxhlet apparatus. The ether extract was collected in a flask.

Reagents preparation:

Dichloromethane

Methods:

- 1 Bottom flask was dried round with 2 – 3 pieces of boiling chip at 100 °C for 15 min.
- 2 Then, the bottom flask with pieces was cooled in a desiccator and weight (W_a).
- 3 The sample was weighted approximately 3 g (weight nearest 0.01 g) on sugar filter paper and transfer to an extraction thimble (W_s).
- 4 The thimble was placed inside percolator of the Soxhlet apparatus. The Soxhlet apparatus and sample were assembled and extracted with dichloromethane (200 ml) for 15 h by a condensation rate of at least 5 – 6 drops per second.
- 5 The thimble was removed from the percolator, and then dried at 100 °C for 2 h to constant weight.
- 6 The thimble was removed to desiccator for cooling and weight accurately (W_b).
- 7 The ether extract was calculated as follows:

$$\% EE = \frac{W_b - W_a}{W_s} \times 100$$

1.6 Nitrogen free extract (NFE)

Nitrogen free extract was calculated as follows:

$$\% NFE = \% DM - (\% CP + \% CF + \% EE + \% Ash)$$

Where: DM; dry matter, CP; crude protein, CF; crude fiber, EE; ether extract.

2. Detergent methods analysis (Van Soest *et al.*, 1991)

2.1 Neutral detergent fiber (NDF)

Neutral detergent fiber that is primarily cell wall components of plants (cellulose, hemicellulose, and lignin) were loss on ignition of dried residue remaining after digestion of sample with neutral detergent solution under specific conditions. A neutral detergent solution was used to dissolve the easily digested of cell contents as proteins, sugars, lipids, non- fibrous matter and starch from concentrate feeds.

Reagents preparation

Neutral detergent solution (NDS) – Using 1,000 ml of NDS was used the following ingredients:

- 18.61 g of ethylenedinitrilo – tetraacetic acid (EDTA)
- 6.81 g of sodium borate decahydrate
- 30 g of sodium lauryl sulfate
- 10 ml of ethylene glycol monoethyl ether
- 4.56 g of disodium hydrogen phosphate (Na_2HPO_4)

The procedure of methods:

- The sample was weighted (1 g; W_s) into beaker 600 ml and added 100 ml of neutral detergent solution (NDS) into the beaker.
- The sample in the beaker was boiled for 1 hour.
- The sample in the beaker was removed and filtered through porcelain crucible (W_a).
- The sample was rinsed with boiling distilled water (300 ml; divided into three times with 100 ml/time) through Buchner.
- The residue sample was dried for constant weight at 100 °C for 12 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_b).
- Neutral detergent fiber was calculated as follows:

$$\% \text{ NDF} = \frac{W_b - W_a}{W_s} \times 100$$

2.2 Acid detergent fiber (ADF)

Acid detergent fiber was determined gravimetrically as the residue remaining after extraction by acid detergent solution (ADS). The ADS was used to dissolve cell soluble, hemicellulose and soluble minerals leaving a residue of cellulose, lignin, and heat damaged protein and cell wall protein and minerals (ash).

Reagents preparation

Acid detergent solution (ADS) – Using 1,000 ml of ADS was used the following ingredients:

- 49.04 g of sulfuric acid (standardized to 1 N)
- 20 g of Cetyl trimethylammonium bromide (CTAB).

Methods:

- The sample was weighted (1 g; W_s) into beaker 600 ml and added 100 ml of neutral detergent solution (ADS) into the beaker.
- The sample in the beaker was boiled for 1 hour.
- The sample in the beaker was removed and filtered through porcelain crucible (W_a).
- The sample was rinsed with boiling distilled water (300 ml; divided into three times with 100 ml/time) through Buchner.
- The residue sample was dried for constant weight at 100 °C for 12 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_b).

- Neutral detergent fiber was calculated as follows:

$$\% \text{ NDF} = \frac{W_b - W_a}{W_s} \times 100$$

2.3 Acid detergent lignin (ADL)

Acid detergent lignin was determined from the residue remaining upon ignition after 72% H₂SO₄ digestion.

Reagent preparation:

72% H₂SO₄

Methods:

- The residue sample in the crucible (W_a) from ADF was added 90 ml of 72% H₂SO₄ for digestion of sample.
- The H₂SO₄ were divided into 3 time for putting (30 ml/time/1 hour).
- The sample was rinsed with boiling distilled water (300 ml; divided into three times with 100 ml/time) through Buchner.
- The residue sample was dried for constant weight at 100 °C for 12 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_b).
- The residue sample in the crucible was ignited at 550 °C for 6 h, and then place in a desiccator to cool (15 – 30 min) and weight the sample after cooling (W_c).
- Acid detergent lignin was calculated as follows:

$$\% \text{ ADL} = \frac{W_b - W_c}{W_a} \times 100$$

APPENDIX II: EXPERIMENT I STATISTICAL ANALYSIS

2.1 Nutrient intake

Table 2.1 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on dry matter intake of local female goats in Laos

Dependent variable: Dry matter intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.435 ^a	4	.109	46.217	.000
Intercept	25.154	1	25.154	10688.671	.000
Treatment	.420	3	.140	59.427	.000
Block	.016	1	.016	6.588	.019
Error	.045	19	.002		
Total	25.633	24			

Table 2.2 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on organic matter intake of local female goats in Laos

Dependent variable: Organic matter intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.307 ^a	4	.077	56.827	.000
Intercept	15.811	1	15.811	11704.444	.000
Treatment	.297	3	.099	73.401	.000
Block	.010	1	.010	7.106	.015
Error	.026	19	.001		
Total	16.144	24			

Table 2.3 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on crude protein intake of local female goats in Laos

Dependent variable: Crude protein intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.010 ^a	4	.003	27.888	.000
Intercept	.848	1	.848	9223.434	.000
Treatment	.010	3	.003	35.355	.000
Block	.001	1	.001	5.487	.030
Error	.002	19	9.189E-005		
Total	.860	24			

Table 2.4 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on ether extract intake of local female goats in Laos

Dependent variable: Ether extract intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	47.143 ^a	4	11.786	455.355	.000
Intercept	549.509	1	549.509	21230.960	.000
Treatment	46.983	3	15.661	605.079	.000
Block	.160	1	.160	6.184	.022
Error	.492	19	.026		
Total	597.144	24			

Table 2.5 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on crude fiber intake of local female goats in Laos

Dependent variable: Crude fiber intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.003 ^a	4	.001	19.432	.000
Intercept	.427	1	.427	11054.545	.000
Treatment	.003	3	.001	23.606	.000
Block	.000	1	.000	6.909	.017
Error	.001	19	3.860E-005		
Total	.430	24			

Table 2.6 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on nitrogen free extract intake of local female goats in Laos

Dependent variable: Nitrogen free extract intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.154 ^a	4	.038	68.316	.000
Intercept	6.324	1	6.324	11247.526	.000
Treatment	.150	3	.050	88.864	.000
Block	.004	1	.004	6.669	.018
Error	.011	19	.001		
Total	6.489	24			

Table 2.7 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on neutral detergent fiber intake of local female goats in Laos

Dependent variable: Neutral detergent fiber intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.027 ^a	4	.007	16.357	.000
Intercept	3.619	1	3.619	8797.365	.000
Treatment	.024	3	.008	19.527	.000
Block	.003	1	.003	6.846	.017
Error	.008	19	.000		
Total	3.654	24			

Table 2.8 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on acid detergent fiber intake of local female goats in Laos

Dependent variable: Acid detergent fiber intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.005 ^a	4	.001	7.961	.001
Intercept	1.017	1	1.017	6475.816	.000
Treatment	.004	3	.001	8.881	.001
Block	.001	1	.001	5.201	.034
Error	.003	19	.000		
Total	1.025	24			

Table 2.9 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on acid detergent lignin intake of local female goats in Laos

Dependent variable: Acid detergent lignin intake (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.000 ^a	4	6.250E-005	5.938	.003
Intercept	.018	1	.018	1724.250	.000
Treatment	.000	3	6.111E-005	5.806	.001
Block	6.667E-005	1	6.667E-005	6.333	.021
Error	.000	19	1.053E-005		
Total	.019	24			

2.2 Growth performance

Table 2.10 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on initial weight of the experiment 1 of local female goats in Laos

Dependent variable: Initial weight (kg)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	114.042 ^a	4	28.510	4.157	.014
Intercept	12127.510	1	12127.510	1768.430	.000
Treatment	5.241	3	1.747	.255	.857
Block	108.800	1	108.800	15.865	.001
Error	130.298	19	6.858		
Total	12371.850	24			

Table 2.11 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on final weight of the experiment 1 of local female goats in Laos

Dependent variable:: Final weight (kg)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	162.345 ^a	4	40.586	4.881	.007
Intercept	17897.882	1	17897.882	2152.368	.000
Treatment	44.418	3	14.806	1.781	.185
Block	117.927	1	117.927	14.182	.001
Error	157.993	19	8.315		
Total	18218.220	24			

Table 2.12 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on body weight change of the experiment 1 of local female goats in Laos

Dependent variable: Body weight change (kg)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	26.065 ^a	4	6.516	11.523	.000
Intercept	559.700	1	559.700	989.737	.000
Treatment	25.881	3	8.627	15.256	.000
Block	.184	1	.184	.325	.575
Error	10.745	19	.566		
Total	596.510	24			

Table 2.13 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on average daily gain of the experiment 1 of local female goats in Laos

Dependent variable: Average daily gain (g)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3079.563 ^a	4	769.891	11.522	.000
Intercept	66131.101	1	66131.101	989.663	.000
Treatment	3057.865	3	1019.288	15.254	.000
Block	21.698	1	21.698	.325	.575
Error	1269.615	19	66.822		
Total	70480.279	24			

Table 2.14 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on percentage of DMI per body weight of local female goats in Laos

Dependent variable: Percentage of DMI (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5.517 ^a	4	1.379	12.859	.000
Intercept	412.842	1	412.842	3849.061	.000
Treatment	4.134	3	1.378	12.849	.000
Block	1.382	1	1.382	12.889	.002
Error	2.038	19	.107		
Total	420.397	24			

Table 2.15 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on feed conversion ratio of the experiment 1 of local female goats in Laos

Dependent variable: Feed conversion ratio

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	133.833 ^a	4	33.458	3.320	.032
Intercept	9922.667	1	9922.667	984.494	.000
Treatment	132.333	3	44.111	4.377	.017
Block	1.500	1	1.500	.149	.704
Error	191.500	19	10.079		
Total	10248.000	24			

2.3 Digestibility

Table 2.16 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on dry matter digestibility of local female goats in Laos

Dependent variable: Dry matter digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	91.272 ^a	4	22.818	15.969	.000
Intercept	176818.383	1	176818.383	123742.527	.000
Treatment	90.491	3	30.164	21.109	.000
Block	.781	1	.781	.547	.469
Error	27.150	19	1.429		
Total	176936.805	24			

Table 2.17 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on organic matter digestibility of local female goats in Laos

Dependent variable: Organic matter digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	40.413 ^a	4	10.103	9.213	.000
Intercept	187448.678	1	187448.678	170926.290	.000
Treatment	40.412	3	13.471	12.283	.000
Block	.000	1	.000	.000	.989
Error	20.837	19	1.097		
Total	187509.927	24			

Table 2.18 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on crude protein digestibility of local female goats in Laos

Dependent variable: Crude protein digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	25.980 ^a	4	6.495	4.831	.007
Intercept	190086.200	1	190086.200	141396.086	.000
Treatment	25.980	3	8.660	6.442	.003
Block	.000	1	.000	.000	.989
Error	25.543	19	1.344		
Total	190137.723	24			

Table 2.19 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on ether extract digestibility of local female goats in Laos

Dependent variable: Ether extract digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2167.822 ^a	4	541.956	119.792	.000
Intercept	151825.952	1	151825.952	33559.222	.000
Treatment	2156.034	3	718.678	158.855	.000
Block	11.788	1	11.788	2.606	.123
Error	85.958	19	4.524		
Total	154079.733	24			

Table 2.20 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on crude fiber digestibility of local female goats in Laos

Dependent variable: Crude fiber digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	28.291 ^a	4	7.073	.780	.552
Intercept	133219.410	1	133219.410	14686.931	.000
Treatment	28.285	3	9.428	1.039	.398
Block	.005	1	.005	.001	.981
Error	172.342	19	9.071		
Total	133420.043	24			

Table 2. 21 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on nitrogen free extract digestibility of local female goats in Laos

Dependent variable: Nitrogen free extract digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	15.729 ^a	4	3.932	5.207	.005
Intercept	206947.796	1	206947.796	274066.741	.000
Treatment	15.497	3	5.166	6.841	.003
Block	.232	1	.232	.307	.586
Error	14.347	19	.755		
Total	206977.872	24			

Table 2.22 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on neutral detergent fiber digestibility of local female goats in Laos

Dependent variable: Neutral detergent fiber digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	36.248 ^a	4	9.062	2.029	.131
Intercept	147272.933	1	147272.933	32975.451	.000
Treatment	35.367	3	11.789	2.640	.079
Block	.882	1	.882	.197	.662
Error	84.857	19	4.466		
Total	147394.038	24			

Table 2.23 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on acid detergent fiber digestibility of local female goats in Laos

Dependent variable: Acid detergent fiber digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	18.829 ^a	4	4.707	.969	.447
Intercept	135824.756	1	135824.756	27964.557	.000
Treatment	17.383	3	5.794	1.193	.339
Block	1.446	1	1.446	.298	.592
Error	92.284	19	4.857		
Total	135935.868	24			

Table 2.24 ANOVA: Effect of paper mulberry leaves as basal diet with concentrate supplementation on acid detergent lignin digestibility of local female goats in Laos

Dependent variable: Acid detergent lignin digestibility (%)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	508.916 ^a	4	127.229	1.366	.283
Intercept	39478.671	1	39478.671	423.938	.000
Treatment	505.608	3	168.536	1.810	.180
Block	3.308	1	3.308	.036	.853
Error	1769.350	19	93.124		
Total	41756.936	24			

APPENDIX III: EXPERIMENT II STATISTICAL ANALYSIS

3.1 Growth performance

Table 3.1 Initial weight of local female goats in Laos, experiment 2

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TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	15.53333333	2.99615916	0.86491665	Unequal	0.1315	19.6	0.8967
T2	12	15.33333333	4.33449868	1.25126199	Equal	0.1315	22.0	0.8966
For H0: Variances are equal, F' = 2.09 DF = (11,11) Prob>F' = 0.2363								

Table 3.2 Final weight of the experiment 2

TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	17.02500000	2.81041084	0.81129573	Unequal	-1.0676	19.8	0.2986
T2	12	18.52500000	3.97380628	1.14713906	Equal	-1.0676	22.0	0.2973
For H0: Variances are equal, F' = 2.00 DF = (11,11) Prob>F' = 0.2660								

Table 3.3 Body weight change of the experiment 2

TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	1.49166667	0.55178773	0.15928740	Unequal	-5.4342	17.9	0.0001
T2	12	3.19166667	0.93269729	0.26924652	Equal	-5.4342	22.0	0.0000
For H0: Variances are equal, F' = 2.86 DF = (11,11) Prob>F' = 0.0957								

Table 3.4 Total feed intake of the experiment 2

TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	768.83333333	22.24178432	6.42065008	Unequal	-30.1583	20.5	0.0001
T2	12	1090.50000000	29.50346667	8.51691721	Equal	-30.1583	22.0	0.0000
For H0: Variances are equal, F' = 1.76 DF = (11,11) Prob>F' = 0.3627								

Table 3.5 Average daily gain of the experiment 2

TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	25.00000000	9.01513878	2.60244640	Unequal	-5.3908	17.5	0.0001
T2	12	53.16666667	15.69500982	4.53075907	Equal	-5.3908	22.0	0.0000
For H0: Variances are equal, F' = 3.03						DF = (11,11)	Prob>F' = 0.0792	

Table 3.6 Feed conversion ratio of the experiment 2

TRT	N	Mean	Std Dev	Std Error	Variances	T	DF	Prob>T
T1	12	34.83333333	11.84623710	3.41971409	Unequal	3.2393	16.9	0.0049
T2	12	22.25000000	6.38357267	1.84277870	Equal	3.2393	22.0	0.0038
For H0: Variances are equal, F' = 3.44						DF = (11,11)	Prob>F' = 0.0515	

2.2 Onset of estrus

Table 3.7 Onset of estrus, pre-synchronization (1)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.719	0.397
2	Row Mean Scores Differ	1	0.719	0.397
3	General Association	1	0.719	0.397

Table 3.8 Onset of estrus, pre-synchronization (2)

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.193	0.660
2	Row Mean Scores Differ	1	0.193	0.660
3	General Association	1	0.193	0.660

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Publication	1. Bouasavanh. B., S. Yammuen-art, and T. Moonmanee. 2016. Effects of concentrate supplementation levels with fresh paper mulberry leaves (<i>Broussonetia papyrifera</i>) on growth performance and digestibility of local female goats in Lao PDR. Khon Kean Agriculture Journal. 44: 68-76.

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