

APRW -67

Influence of *Carica papaya* Leaf Extract on Body Weight Dynamics, Organ Weight, and Carcass Characteristics of Male and Female Rabbits

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Abstract

A comparative study was carried out to show the influence of *Carica papaya* Leaf extract (CPLE) on organ weight, body weight dynamics and carcass of male and female rabbits using a two by four (2x4) factorial experimental design. Twenty four (24) crossbred weaner rabbits (6-8 weeks old) of both sexes were divided into groups 1 and 2 of twelve animals each, such that group 1 were all male and group 2, all female animals. Each group was then divided into treatments according to the doses of the extract assigned randomly as follows: T₁ (0.0 ml CPLE), T₂ (0.5 ml CPLE), T₃ (1.0 ml CPLE) and T₄ (1.5 ml CPLE). The results obtained showed no significant difference ($p>0.05$) for body weight dynamics and carcass, and a significant difference ($p<0.05$) for weight of organs such as the liver, heart and the kidney especially in the interaction between treatment and sex. No significant difference ($p>0.05$) was observed for the lungs across treatments and in the interaction between treatment and sex. All levels of inclusion are recommended for organ weights as the weight of organs were still within the normal range which is an indication that the different levels of inclusion of the extract do not have any adverse effect on the animals.

Keywords: Rabbit, organ weight, body weight, carcass, leaf extract

Introduction

The physiology of farm animals is affected by several factors, one of which is nutrition (Ajao *et al.*, 2013). The weight of the liver, kidney and heart are important physiologic parameters as weight of organs is essential in determining the functionality of organs and the animals in general. In feeding trials, the use of weights of some internal organs serves as indicators of toxicity (Sese and Berepubo, 1996; Farid, 2001). According to Sese *et al.* (2014), the differences in the weight of organs could be as a result of increased metabolic rate of the organs in attempt to reduce toxic elements or anti nutritional factors to non-toxic metabolites which go a long way to determining the physiological status of the animal.

This study reports the effect of *Carica papaya* Leaf extract on organ weight, body weight dynamics and carcass of male and female rabbits

Results and Discussions

Table 1 shows organ weights across treatments, sex, and interaction between treatment and sex. Liver weight varied significantly ($p<0.05$) across treatment and in the interaction between treatment and sex, there was no significant difference ($p>0.05$) between sex. Also, weight of the heart varied significantly ($p<0.05$) across treatment, sex and the interaction between treatment and sex. The kidney also varied significantly ($p<0.05$) across the interaction between treatment and sex as there was no significant difference across treatments and sex. Furthermore, the weight of the lungs across treatments showed significant difference ($p<0.05$) between sex, there was no significant difference among treatment as well as in the interaction between treatment and sex. In feeding trials, the use of weights of some internal organs like the liver or kidneys as indicators of toxicity is a known common practice because they should differ significant if there was any serious effect of anti-nutritional factors on them being major detoxification organs (Sese and Berepubo, 1996; Farid, 2001). Such differences in weight are attributed to increased metabolic rate of the organs in attempt to reduce toxic elements or anti nutritional factors to non-toxic metabolites (Sese *et al.*, 2014).

Table 2 shows body weight dynamics of young rabbits given different dosages of Papaya extract. Weight gain was not significant ($p>0.05$) across the four treatment groups, between sex, as well as the interaction between treatment and sex. Table 3 shows a significant difference ($p<0.05$) on some of the carcass parameters of both male and female rabbits at various treatment levels. Slaughter weight, dress weight and dressing percentage were significant ($p<0.05$) across treatments. There was no significant difference ($p>0.05$) seen in sex as well as in the interaction between treatment and sex. Comparing means, there was no significant difference between the means across treatments for slaughter weight. For dress weight, T₄ was significantly different from the rest of the treatments. For dressing percentage, T₄ and T₃ were significantly different from the rest.

Table 1: Influence of CPLE on organ weight

Factors	Liver (%)	Heart (%)	Kidney (%)	Lungs (%)
T ₁ (control)	3.140 ^a	0.408	1.008 ^a	0.982
T ₂ (0.5ml CPLE)	4.190 ^{ab}	0.470	1.047 ^{ab}	0.823
T ₃ (1.0ml CPLE)	3.810 ^{bc}	0.397	1.247 ^{ab}	0.952
T ₄ (1.5ml CPLE)	3.577 ^c	0.393	1.095 ^b	0.807
SEM	0.170	0.038	0.064	0.068
P-Level	0.004*	0.462 ^{ns}	0.082 ^{ns}	0.208 ^{ns}
Sex 1- Male	3.700	0.472	1.124	0.963
Sex 2- Female	3.650	0.363	1.074	0.818
SEM	0.120	0.027	0.045	0.048
P-Level	0.779 ^{ns}	0.011*	0.446 ^{ns}	0.049*
Interaction between treatment and sex				
T ₁ : Male	3.460 ^{bc}	0.487 ^{ab}	1.243 ^{ab}	1.190 ^a
T ₁ : Female	2.820 ^{bc}	0.330 ^a	0.773 ^{ab}	0.773 ^b
T ₂ : Male	3.600 ^{ab}	0.613 ^b	1.107 ^{ab}	0.823 ^{ab}
T ₂ : Female	4.773 ^{bc}	0.327 ^b	0.987 ^{bc}	0.823 ^b
T ₃ : Male	4.190 ^c	0.427 ^b	1.187 ^c	1.017 ^b
T ₃ : Female	3.430 ^a	0.367 ^b	1.307 ^{bc}	0.887 ^b
T ₄ : Male	3.560 ^{bc}	0.360 ^b	0.960 ^a	0.823 ^b
T ₄ : Female	3.593 ^{bc}	0.427 ^b	1.230 ^{ab}	0.790 ^b
SEM	0.240	0.053	0.090	0.096
P-LEVEL	0.002*	0.024*	0.011*	0.090 ^{ns}

*SEM: Standard error mean, *CPLE: *Carica papaya* leaf extract, *(p<0.05) *Means with the same superscript across column are not significantly different *T₁: 0.0ml CPLE, T₂: 0.5ml CPLE, T₃: 1.0ml CPLE, T₄: 1.5ml CPLE.

Table 2: Influence of CPLE on body weight of male and female rabbits fed different doses of the extract

Factors	Initial Weight (kg)	Final Weight (kg)	Weight Gain (kg)	Daily Weight Gain
T ₁ (control)	0.787	1.476	0.688	0.012
T ₂ (0.5ml CPLE)	0.713	1.510	0.797	0.014
T ₃ (1.0ml CPLE)	0.782	1.533	0.751	0.013
T ₄ (1.5ml CPLE)	0.908	1.609	0.701	0.013
SEM	0.092	0.066	0.058	0.001
P-LEVEL	0.526 ^{ns}	0.545 ^{ns}	0.551 ^{ns}	0.501 ^{ns}
SEX 1- Male	0.810	1.517	0.707	0.013
SEX 2- Female	0.785	1.547	0.762	0.014
SEM	0.065	0.047	0.041	0.001
P-LEVEL	0.791 ^{ns}	0.649 ^{ns}	0.355 ^{ns}	0.363 ^{ns}
Interaction between treatment and sex				
T ₁ : Male	0.863	1.571	0.708 ^{ab}	0.013
T ₁ : Female	0.711	1.380	0.669 ^a	0.012
T ₂ : Male	0.620	1.504	0.833 ^{ab}	0.016
T ₂ : Female	0.806	1.516	0.711 ^b	0.013
T ₃ : Male	0.784	1.428	0.644 ^{ab}	0.012
T ₃ : Female	0.781	1.639	0.858 ^{ab}	0.016
T ₄ : Male	0.973	1.564	0.592 ^{ab}	0.011
T ₄ : Female	0.844	1.654	0.811 ^{ab}	0.014
SEM	0.130	0.093	0.083	0.002
P-LEVEL	0.564 ^{ns}	0.222 ^{ns}	0.076 ^{ns}	0.116 ^{ns}

*CPLE: *Carica papaya* leaf extract, *SEM: standard error mean, (p>0.05)

*T₁: 0.0ml CPLE, T₂: 0.5ml CPLE, T₃: 1.0ml CPLE, T₄: 1.5ml CPLE.

Table 3: Influence of CPLE on carcass of male and female rabbits fed different doses of the extract

Factors	Live weight (kg)	Slaughter weight (kg)	Dress weight (kg)	Dressing percentage
T ₁ (control)	1.496	1.468 ^a	0.917 ^a	62.48 ^a
T ₂ (0.5ml CPLE)	1.488	1.430 ^{ab}	0.909 ^a	63.62 ^a
T ₃ (1.0ml CPLE)	1.413	1.339 ^b	0.944 ^a	70.91 ^b
T ₄ (1.5ml CPLE)	1.559	1.505 ^a	1.093 ^b	72.37 ^b
SEM	0.048	0.037	0.039	1.95
P-Level	0.238 ^{ns}	0.032 [*]	0.014 [*]	0.004 [*]
SEX 1- Male	1.472	1.428	0.967	67.83
SEX 2- Female	1.507	1.442	0.964	66.86
SEM	0.034	0.026	0.028	1.38
P-Level	0.476 ^{ns}	0.713 ^{ns}	0.948 ^{ns}	0.623 ^{ns}
Interaction between treatment and sex				
T ₁ : Male	1.523	1.492	0.925	62.01
T ₁ : Female	1.470	1.444	0.909	62.95
T ₂ : Male	1.466	1.430	0.904	63.24
T ₂ : Female	1.510	1.430	0.915	64.00
T ₃ : Male	1.349	1.273	0.932	73.48
T ₃ : Female	1.477	1.404	0.956	68.34
T ₄ : Male	1.549	1.519	1.107	72.61
T ₄ : Female	1.570	1.491	1.078	72.14
SEM	0.068	0.052	0.055	2.76
P-Level	0.625 ^{ns}	0.341 ^{ns}	0.961 ^{ns}	0.667 ^{ns}

*CPLE: *Carica papaya* leaf extract, *SEM: standard error mean, (p>0.05): no significant difference* T₁: 0.0ml CPLE, T₂: 0.5ml CPLE, T₃: 1.0ml CPLE, T₄: 1.5ml CPLE.

Conclusion and Recommendation

All levels of inclusion are recommended for organ weights as the weight of organs were still within the normal range which is an indication that the different levels of inclusion of the extract do not have any adverse effect on the animals.

References

- Ajao, B.H., Ola, S.L., Adameji, O.V. and Kolawole, R.F. (2013). The relationship of ambient temperature and relative humidity of thermo-respiratory function of greater grass cutter. *Proceedings of the 18th Annual Conference of Animal Science Association of Nigeria* 92.
- Farid, E.A., (2001). Toxicology and human health effects following exposure to oxygenated or reformulated gasoline, *Toxicology Letters*, 123-113.
- Sese, B.T., Kpeku, M. and Igrigi, A. (2014). Impact of tropical velvet bean (*Mucuna utilis*) leaf meal on performance, organ weight, and haematological indices of young rabbits. *Journal of Animal Science Advances*, 4(4):777-786.
- Sese, B.T. and Berepubo, N.A. (1996). Growth response and organweight of young rabbits for graded levels of dietary soybean in the humid tropics. *World Rabbit Science Association*, 4(1):15-18.