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ANALYSING THE IMPACT OF DIETS ON CATTLE'S MILK PRODUCTION IN EKITI STATE, NIGERIA

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Abstract

The paper is out to examine the impact of different diets on cattle and its productivity in Ekiti State, Nigeria. The study divided the data into two; milk production and feed consumption, employing Randomize complete block design (RCBD). The result of the analysis showed that diets were significantly different for feed consumption and for milk production, diets have no significant differences.

Keywords: milk production, feed consumption, experimental design.

Introduction

Farm animals can either be non ruminants or ruminants, the latter are artiodactyls ungulate mammal which chew cud, such as dear, cow and cattle. Non Ruminant animals have four stomachs – rumen, reticulum, omasum and abomasums. Cattle have been existing for years. It belongs to the genus, modern breeds descended from two varieties of the species Taurus. These wild oxen called anchors had a hump over its shoulders. Braham cattle developed from this hampered variety. But most United State and United European breeds is descendant of humpies varieties. People have raised cattle, for thousands of year pictures carved in ancient Egyptian tombs show oxen pulling plows treading grain. Cattle raisers once followed their herds from land to land as the cattle searched for grass to eat. Later, some of these herders and their families settled in one place, they fed their cattle grain in addition to grass. The first cattle were used as work animal as well as for producing milk and beef. People began to breed cattle either as beef animal or for producing milk. Cattle dairy and beef comprises a major portion of animal agriculture. Traditionally, animals and dairy science have been divided into then discipline of physiology, nutrition and animal breeding. Increased production efficiency should result from the incorporation of present knowledge of behavior research. Cattle productions are farmed for beef, veal, dairy, leather and milk. Milk as exploit its relative

abundance in essential amino acid, essential fatty acids iron and other nutrient required for growth or healing and for children, lactation and for convalescence. Cattle are commonly used for conservation, grazing simple to maintain grass land for wild-life.

Cattle were first brought to the Americans by Norwaigian. Vikings in the early 1000's. Railroads has helped cattle ranchers by transporting cattle to the eastern market railroads cars that were refrigerated made it possible to ship meat product long distances.

METHODOLOGY

Randomized complete block design (RCBD) is a design use when the experimental units are not homogeneous and thus can be allocated to groups of block such that the variation among blocks is maximized while the variation within any particular block is minimized. These blocks are sometimes called the replicates.

The model for randomized complete block design (RCBD) contained the assumption of no interaction effects, when both the block and treatment effect are fixed and there are b (block replication) and t(treatment).

There are two basic types of error that can be committed in the conduct of an experiment.

Type 1 error is the error committed when rejecting a true null hypothesis H0. The probability of committed type 1 error is called the level of significance, it is the maximum probability allotted to committing type 1 error. It is usually denoted by α

Type 11 error this is when accepting a false null hypothesis. The probability of committing type 11 error is usually denoted by β

The probabilities of committing the two errors and also of making correct decision are presented below

DECISION	TRUE H0	FALSE H0
Accepted	1 – α	B
Rejected	A	1 – β

MODEL FOR RCBD

Yij = the observation ith treatment jth block

μ = the overall mean effect

Ti = the effect of ith treatment

Bj = The effect of jth block

Eij = The random error in the ith and jth cell

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For i= 1,2,…….. i

J= 1,2……j

ANALYSIS OF VARIANCE (ANOVA) TABLE

Sources of variation	Sum of Square	Degree of Freedom	Mean Square	F calculated
Block	SSB	(b – 1)	MSB	MSB/MSE
Treatment	SSt	(t – 1)	MSt	MSt/MSE
Error	SSE	(b – 1)(t – 1)	MSE	
Total	SST	(bt -1)or (n- 1)		

TEST STATISTIC

F* = MSB/MSE

F* = MSt/MSE

Reject the null hypothesis if F calculated > F tabulated and there exist a level of significant and Accept the null hypothesis if F calculated is < F tabulated and there exist no level of significant.

ANALYSIS OF MILK PRODUCTION FOR CATTLE TREATMENT

Block	W7.0	W9.0	W4.5	W0.0	TOTAL
Day 1	102	113	97	107	419
Day 2	100	109	107	112	428
Day 3	109	114	114	111	448
Day 4	106	114	119	120	459
Day 5	110	113	104	108	435
Day 6	114	111	112	113	450
Day 7	104	112	117	120	453
TOTAL	745	786	770	791	3092

COMPUTATION OF SUM OF SQUARE

Correction Factors = $Y..^2/n$

= $(102 + 100+ 109 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots+ 120)^2/ 28$

= $(3092)^2/28$

= 341445.14

Sum of Square for Total (SST) = $\sum Yij^2 – C.F$

SST = $(102)^2 + (100)^2+ (109)^2+ \ldots\ldots\ldots\ldots\ldots\ldots +(120)^2 – 341445.14$

= 342320 – 341445.14

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= 874.86

Sum of Square for Block (SSB) = $\sum Y.j^2 / t$

$$SSB = \frac{(419)^2 + (428)^2 + (448)^2 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + (453)^2}{4} - 341445.14$$

= 320.86

Sum of Square for Treatment (SSt) = $\sum Yi.^2/b - C.F$

$$SSt = \frac{(745)^2 + (786)^2 + (770)^2 + (791)^2}{7} - 341445.14$$

= 341628.8 – 341445.14 = 183.71

Sum of Square for Error (SSE)

SSE = SST –SSB – SSt

= 874.86 – 320.86 – 183.71

= 370.29

COMPUTATION FOR MEAN SQUARE

Degree of freedom for block = (b - 1) = 7 – 1= 6

Degree of freedom for Treatment (t - 1) = 4 – 1 = 3

Degree of freedom for Error (b -1)(t - 1) = 6 X 3 = 18

Degree of freedom for Total (bt - 1) =((7 X 4) – 1) = 27

MEAN SQUARE FOR BLOCK (MSB)

MSB = SSB/dfb

= 320.86/6 = 53.47

MEAN SQUARE FOR TREATMENT (MSt)

MSt = SSt/dft

= 183.7/3 = 61.23

MEAN SQUARE FOR ERROR (MSE)

MSE = SSE/dfe

= 370.29/18 = 20.57

COMPUTATION OF F – CALCULATED

FOR BLOCK

MSB/MSE = 53.47/20.57

= 2.599

FOR TREATMENT

MSt/MSE = 61.23/20.57

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= 2.97

F – TABULATED

for treatment at 5% level of significant

$F_{0.05\ (3,18)}$ = 3.16

For Treatment at 1% level of significant

$F_{0.01\ (3,18)}$ = 5.09

For Block at 5% level of significant

$F_{0.05\ (6,18)}$ = 2.66

For Block at 1% level of significant

$F_{0.01\ (3,18)}$ = 4.01

ANALYSIS OF VARIANCE (ANOVA) TABLE FOR MILK PRODUCTION

ANOVA TABLE

Sources of Variation	Degree of Freedom	Sum of Square	Mean Square	F-Calculated	F – Tabulated at 5%	F – Calculated at 1%
Block	6	320.86	53.47	2.59	2.66	4.01
Treatment	3	183.71	61.23	2.97	3.16	5.09
Error	18	370.29	20.57			
Total	27	874.87				

FRIEDMAN TEST STATISTIC

$\times^2 F = SSt + (SSt + SSE)/b(t-1)$

$= 183.71 + \frac{[(183.71 + 370.29)]}{[7(3)]}$

= 210.09

$\times^2_{(b-1)(1-0.05)}$

$\times^2_{(4-1),\ 0.95} = 14.04$

$\times^2 F > \times^2_{(3,0.95)}$, Then we reject the null hypothesis Ho that is diets were significantly different.

RELATIVE EFFICIENT

R.E = MSE CRD/ MSE/ RCBD x 100%

$= \frac{[SSB + b(t-1)MSE\ RCBD]}{[MSE\ RCBD\ (bt-1)]} X\ 100$

= (752.2/555.39) X 100

= 135.4

Because the degree of freedom for error in this analysis is less than 20 then we adjusted the relative efficient by it by factor K.

Factor K = [(dfe RBCD + 1)(dfe CRD + 3)]/[(b -1)(t-1)+3][t(b-1)+1]

= [(7-1)(4 -1)+1][4(7-1)+3]/[(7-1)(4-1)+3][4(7-1)+1]

= [(18 + 1)(24+3)]/[(18+3)(24+1)]

= 513/525

Since R.E exceed 100% by p then we say that blocking has increased the experimental precision by p.

Adjusted R.E = 135.4 X 0.977 = 132.2858

P = 132.32 – 100

P = 32.30

Hence p = 32.30%

DECISION: Considering the effect of diets, we accepted the null hypothesis for Block and Treatment we therefore concluded that the diets were significant at 5% and 1% level of significance.

SUMMARY

This research work was carried out to test the effect of different diets on cattle in Department of Animal Production and health Science, faculty of agriculture, University of Ado – Ekiti, Nigeria. Data were analyzed using Analysis of variance (ANOVA) and Freidman's test Statistic, from the result of the analysis of variance (ANOVA), Freidman's test, for Milk Production, the F – calculated is greater than F – tabulated, hence we rejected the null hypothesis H0 that is diets were significantly different.

CONCLUSION

The result of analysis on effect of diets on cattle for Milk Production, diets were significantly different. We hereby concluded that diets have greater effects on cattle milk production.

RECOMMENDATION

Since Diets has greater effect on cattle production, we hereby recommended that farm Animal production should cultivate the habit of feeding their cattle with good diets such as, steam – flaked corn, cotton seed meal, fat (yellow grease) and molasses. For increasing their milk production.

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