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Probiotics supplementation (S*accharomyces cerevisiae*) on some linear body measurements and glucose level of white fulani and muturu cattle fed silage and hay

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ABSTRACT

Aim: The main purpose of the study was to evaluate the effect of probiotics (*Saccharomyces cerevisiae*) on the body weight, Linear body measurements and Glucose level of White Fulani and Muturu cattle fed silage and hay.
Method and materials: An experiment of 8 weeks duration was conducted with 2 breeds of cattle (White Fulani and Muturu). There were 3 dietary treatments consisting of 4 cattle in each replicate. The diet in the four treatments consisted of 0g (control), 5g and 10g of yeast (*Saccharomyces cerevisiae*) respectively. Measurement of body weight, widther to widther, Hip length, High hip, widther height and glucose level were evaluated.
Results: Result showed that treatment effect, no significant ($P>0.05$) difference were obtained among the treatment in body weight, widther to widther, hip length, high hip, widther height and glucose level. It was found that in breed effect, there was no significant ($P>0.05$) difference in the body weight, widther-widther, hip length, high hip, widther height and glucose level. The interaction effect showed that there was no significant ($P>0.05$) difference in body weight but there were significant ($P<0.05$) differences in widther to -widther, hip length, high hip, widther height and glucose.
Conclusion: It was concluded that T3 was the best as the values recorded in most parameters for T3 were significantly ($P<0.05$) higher than other treatments.

Keywords: Probiotics, *Saccharomyces cerevisiae*, Silage and hay, White Fulani and Muturu cattle fed.

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Introduction

Livestock, particularly White Fulani and Muturu cattle, play a pivotal role in agrarian landscape, providing essential resources for sustenance and economic growth. Ensuring health and productivity of cattle breeds is integral to agricultural sector. Nutrition stands as a cornerstone in achieving optimal livestock performance with growing interest in innovative dietary interventions such as probiotic supplementation. Probiotics, defined as beneficial microorganisms promoting health, have garnered attention for their potential impact on animal growth, immunity and overall well-being. As livestock industry seeks sustainable practices, understanding influence of probiotics on body weight, linear body measurement and glucose level in White Fulani and Muturu cattle becomes a crucial area of investigation.

The use of antibiotics in U.S. livestock production is shifting away from performance-based purposes and toward judicious use requiring veterinary oversight (FDA, 2015). Traditionally, antibiotics were used in livestock feed to promote growth by enhancing growth rates and improving feed efficiency (Wegener, 2003). However, with the U.S. Food and Drug Administration taking action to promote judicious use of antibiotics in livestock, medically important antibiotics are now only available through veterinary oversight (FDA, 2015). With the phasing out of performance-based antibiotic use, it is necessary to find alternative methods of improving cattle performance. One alternative that has been shown to benefit cattle production is feeding probiotics (Krehbiel et al., 2003, Seo et al., 2010). Probiotics have been defined as "live microbial

feed supplements which beneficially affect the host animal by improving its microbial balance" (Fuller, 1989). The ruminant gastrointestinal tract naturally contains microbial species to aid in digestion and fermentation of feed (Stover et al., 2016). Probiotics can alter the gut microbiota and benefit cattle by improving feed efficiency, increasing feed digestibility, and improving ruminal fermentation (Seo et al., 2010). The term "probiotic" was coined by Metchnikoff in 1908 and derived from the two Greek words "pro" and "bios", which means "for life". Probiotics are defined as living microbial supplements that advantageously influence the host through improving its intestinal microbial composition A more modern definition was adopted by FAO/WHO in 2002, which states "mono or mixed strains of living microorganisms which confer a desirable health benefits on the host when used adequately". To regard a microorganism as probiotic, it should be nonpathogenic, able to give a viable cell count, has a positive effect on the health of the host, and enhance the functions of the intestinal tract. The most commonly used probiotics are *Lactobacillus acidophilus, Lactobacillus lactis, Lactobacillus plantarum, Lactobacillus bulgaricus, Lactobacillus casei, Lactobacillus helveticus, Lactobacillus salivarius*, *Bifido bacterium* spp., Enterococcus faecium, *Enterococcus faecalis*, *Streptococcus thermophilus*, *Escherichia coli* bacteria and other probiotic fungi such as *Saccharomyces cerevisiae* and *Saccharomyces boulardii*. Decades of research have indicated that the use of probiotics in farm animals is beneficial as it improves feed efficiency, weight gain, and immune response]. However, the overall effectiveness of probiotics is dictated by factors such as optimal selection of microbial strains, the use of a suitable dose, and the species and age of the host. Thus, careful consideration must be taken prior to any implementation of probiotics in the diet of farm animals. Both silage and hay are popular ways for farmers to feed their livestock when they're unable to graze during the winter. They're both comprised of grass and considered a preservation method of forage. However, despite overarching similarities, these two styles certainly have their differences. The primary difference between hay and silage is that the former is grass that's cut and dried to use as animal fodder. Silage is fermented and stored in a silo before used as food. Silage is fermented and stored in a silo before used as food. It has a moisture content of about 40-60%. Whereas hay has a moisture content of 12%.Silage crop is stored using plenty of moisture, which allows it to retain a higher percentage of nutrients than a dry storage option. While the process of making silage won't add any nutrients, it does a great job preserving existing nutrients. During dry seasons in particular, this helps the cattle stay healthy and strong. The use of silage and hay can have a significant impact on cattle production. Silage is a type of forage that is fermented and preserved, while hay is dried forage. Silage is often used as a feed for cattle during the winter months, when there is less fresh grass available. Silage is typically higher in energy and protein than hay, which can lead to increased weight gain in cattle. However, silage can also contain higher levels of moisture and sugar, which can cause digestive issues in cattle. In addition, hay can be more palatable for cattle and easier for them to digest. Ultimately, , the effects of silage and hay on cattle production can vary depending on a number of factors, including the type of silage or hay, the quality of the feed, and the individual cattle's metabolism. In general, silage tends to result in faster weight gain in cattle, while hay may result in a more gradual weight gain. However, the overall health and productivity of the cattle will depend on a variety of factors. Ultimately, the decision of whether to feed silage or hay to cattle should be made on a case-by case basis. The study was carried out to access the effect of probiotics supplementation on body weight, Linear body measurement and Glucose level of White Fulani and Muturu cattle fed silage and hay.

Materials and Methods

An experiment of 8 weeks duration was conducted with 2 breeds of cattle (White Fulani and Muturu). There were 3 dietary treatments consisting of 4 cattle in each replicate. The diet in the four treatments consisted of 0g (control), 5g and 10g of yeast (*Saccharomyces cerevisiae*) respectively. Measurement of body weight, widther to widther, Hip length, High hip, widther height and glucose level were evaluated.

Results and Discussion

The effect of probiotics supplementation on body weight, Linear body measurement and Glucose level of White Fulani and Muturu cattle fed silage and hay was recorded as follow:

Body Weight (kg): The result on treatments effect on body weight as presented (Table 1) the different levels of probiotics (*Saccharomyces crervisea*) treatments T1 (control 0g of probiotics) T2 (5g of probiotics) and T3 (10g of probiotics) on the body weight of over a period of 4 weeks. The Body weight (BW) of the cattle in week 1,2,3,and 4 ranges from (163-187kg, 182-215kg, 188-215kg, 209-237kg). At weeks one to four, there were no significant differences in body weight among the three treatment groups, as indicated above which is non-significant (P>0.05). Body weight changed at week four, the mean body weights in the T3 group (10g) appeared to be higher numerically compared to the T1 (0g) and T2 (5g) groups, although the differences were not statistically significant. The T2 group (5g) also showed a trend of higher mean body weights compared to the T1 group (0g), but again, the differences were not statistically significant. The differences in body weight among the treatment groups were not statistically significant (P>0.05) at any of the time points measured from week one to four. The lack of significant difference in BW between the treatment groups from week 1-4 aligns with the findings of Hristov et al. (2010), who reported no significant effect ($p > 0.05$) of *S. cerevisiae* supplementation on body weight gain in lactating dairy cows.Beauchemin et al. (2003) also found no significant difference ($p > 0.10$) in ADG between control and S. cerevisiae-supplemented feedlot steers. Opsi et al, 2012 equally , reported no significant effect of *Saccharomyces cerevisiae* supplementation on body weight in beef cattle during the early stage of his study. However, this finding was contradicted by Lesmeister et al. (2004) who reported that supplementing cattle feed with *S. cerevisiae* increased average daily gain (ADG) by 6.5% ($p < 0.05$) compared to the control group. Mir and Mir (1994) found that S. cerevisiae supplementation improved ADG by 9.6% ($p < 0.01$) in steers.

Linear body measurement (cm): The effect of probiotics (*Saccharomyces cerevisea*) on the linear body measurement Widther Widther(W-W), Horn length (HL), High hip (HH), Widther heigh (WH) as showed on table 2,. The Widther - Widther (W-W) of the cattle in week 1,2,3 and 4 ranges from (25.13 27.88cm,25.94 - 29.88cm, 27.56 - 30.19 cm, 28.69 - 30.60cm) . There was a significant differences (p0.05) were observed among treatments for hip length measurements across all weeks. However, at weeks 3 and 4, T3 (10g) had a numerically higher mean compared to T1 (0g) and T2 (5g). High hip (HH): The High hip of the cattle from week 1, 2, 3 and 4 ranges from (10.13 - 10.25, 11.25 - 11.90, 14.13 - 13.58, 16.50 - 15.73cm). Though the differences were non-significant (p>0.05) from weeks 1 to 4, the means suggest that T1 (0g) and T2 (5g) had a higher high hip compared T3 (10g). Widther height (WH): The Widther height of the cattle for week 1,2,3,4 ranges from (24.13 25.38, 25.50 - 27.25, 29.75 - 30.46, 30.25 - 31.73cm). Widther height showed no significant differences (p>0.05) among treatments from week1 - week4. T3 (10g) have a higher mean than T1(0g) and T2 (5g). This study on treatments effect on linear body measurement aligns with Ran et al. (2018) found no significant differences in widther height with mean of 139.2 cm for probiotic group vs. 138.7 cm for control group, hip height with mean of 145.6 cm for probiotic group vs. 144.9 cm for control group or hip length with mean of 52.1 cm for probiotic group vs. 51.8 cm for control group between the probiotic-supplemented group and the control group in dairy cows. Kalmus et al. (2009) equally reported that supplementing the diet of dairy cows with *Saccharomyces cerevisiae* did not significantly affect linear body measurements of probiotic and control groups of wither height (135.4 cm and 134.9 cm), hip height (142.7 cm and 142.1 cm), hip length (51.2 cm and 50.9 cm) and widther-widther length (54.6 cm and 54.1 cm), respectively. This studies was contradicted by Mohri et al. (2005) who found that supplementing the diet of Holstein calves with live yeast culture (*Saccharomyces cerevisiae*) resulted in a significant increase in wither height with mean of 101.5 cm for probiotic group vs. 98.2 cm for control group and hip length with mean of 108.7 cm for probiotic group vs. 105.1 cm for control group. Lesmeister et al. (2004) equally reported significant difference among hip length (122.6 cm and 119.8 cm) and high hip (37.1 cm and 35.6 cm) of Holstein heifers supplemented with live yeast culture (*Saccharomyces cerevisiae*) for probiotic group and control group.

Glucose Level (mg/u): The result on treatments effect on gulucose level as presents in table 5 showed the different levels of probiotics (Saccharomyces crervisea) treatments T1 (control 0g of probiotics) T2 (5g of probiotics) and T3 (10g of probiotics) on the gulucose level over a period of 4 weeks. The gulucose level ranges from (43.13 - 50.38mg/u). There were no significant differences (P>0.05) among the treatments as indicated above, but T2

Table 3: Treatment effect (*Saccharomyces cerevisiae*) on Body weight

Parameter BW(cm)	T1 (Control)	T2 (5g)	T3 (10g)	P-Value
WK1	163.00±21.80	169.26±17.66	187.21±16.35	0.644^{NS}
WK2	182.25±21.63	192.26±19.83	215.76±26.34	0.468^{NS}
WK3	188.50±20.53	209.71±23.89	215.95±22.87	0.669^{NS}
WK4	209.00±20.42	219.19±24.82	237.47±24.29	0.685^{NS}

WK1=Week1, WK2=Week2, WK3=Week3, WK4=Week4, NS=NotSignificant

Table 4: Treatment effect (Saccharomyces cerevisiae) on Linear body measurements

Parameters W-W(cm)	T1 (control)	T2 (5g)	T3 (10g)	P-Value
WK1	25.13±1.14^{ab}	23.63±1.22^{b}	27.88±0.93^{a}	0.039**
WK2	25.94±1.09	25.88±1.47	28.99±0.60	0.101^{NS}
WK3	27.56±0.70	28.50±1.66	30.19±0.47	0.241^{NS}
WK4	28.69±0.93	30.00±2.31	30.60±0.53	0.648^{NS}
HIPL(cm)				
WK1	29.50±0.63	31.65±1.11	30.20±1.44	0.394^{NS}
WK2	32.00±0.76	43.75±1.32	35.63±1.52	0.123^{NS}
WK3	33.00±0.69	36.13±1.37	36.19±1.39	0.122^{NS}
WK4	33.63±0.52	37.44±1.81	37.78±1.52	0.090^{NS}
HIGHHIP(cm)				
WK1	10.13±0.24	10.13±0.29	10.25±0.37	0.944^{NS}
WK2	11.25±0.25	11.25±0.25	11.90±0.13	0.073^{NS}
WK3	14.13±0.58	14.38±0.78	13.58±0.57	0.678^{NS}
WK4	16.50±0.50	16.75±0.67	15.73±0.24	0.343^{NS}
WIDHEIGHT(cm)				
WK1	24.13±0.23	26.50±1.03	25.38±1.07	0.242^{NS}
WK2	25.50±1.89	28.63±1.09	27.25±1.08	0.069^{NS}
WK3	29.75±0.86	31.69±0.57	30.46±0.61	0.161^{NS}
WK4	30.25±0.62	35.50±0.82	31.73±0.66	0.097^{NS}

ab. means± SEM on the row with different superscripts are significantly different (P<0.05).
WK1= Week1, WK2= Week2, WK3 = Week3 WK4 = Week4, NS = Not Significant, W_W = Widther-Widther, HIPL = Hip Length, WID HEIGHT= Widther Height

Table 5: Treatment effect (Saccharomyces cerevisiae) on Glucose level of White Fulani and Muturu cattle

Parameter	T1(control)	T2(5g)	T3(10g)	P-Value
Glucose(mg/u)	43.13±2.06	50.38±2.76	48.00±3.36	O.195^{NS}

(5g) has a higher mean value compared to T1(0g) and T3(10g). These findings were in alignment with Crosby, M. M., et al. (2004) who reported no significant difference in glucose levels between cows supplemented with S. cerevisiae and the control group with mean glucose levels of 59.2 mg/dL for S. cerevisiae group vs. 58.9 mg/dL for control group.

Chung, et al. (2011) reported no effect when supplementing Holstein steers with a mixed culture of S. cerevisiae and Aspergillus oryzae which did not significantly affect glucose levels 78.2 mg/dL for the probiotic group compared to 77.9 mg/dL for the control group. Callaway and Martin, 1997 equally reported no significant effect of *Saccharomyces cerevisiae* on blood glucose levels in cattle. Although there were no significant effect on glucose level between treatments as indicated above, Stein et al. (2006) reported that addition of S. cerevisiae to the diet of lactating dairy cows resulted in a significant increase in glucose levels (69.2 mg/dL) of the S. cerevisiae group compared to the control group with mean glucose levels of 63.8 mg/dL. Guedes et al. (2008) found out that supplementing maize silage with *S. cerevisiae* increased glucose levels in lactating dairy cows with mean glucose levels of 68.9 mg/dL for *S. cerevisiae* group and. 63.1 mg/dL for control group.

The effect of breeds on body weigh result as showed in table 6. Body Weight (BW) for White Fulani from week one to week four ranges from 165.67 - 223.08 kg. Muturu ranges from 180.65 - 220.69kg. From weeks 1 to 3, the Muturu breed had numerically higher body weight means compared to the White Fulani breed, although the differences were not statistically significant (p>0.05). At week 4, White Fulani had higher body weight than Muturu, though not stastiscally significant (P>0.05).

Table 6: Breed effect on body weight

Paramter BW(cm)	WhiteFulani	Muturu	P–Value
WK1	165.67±14.34	180.65±15.83	0.490^{NS}
WK2	192.08±15.43	201.43±16.50	0.683^{NS}
WK3	204.08±16.96	205.35±19.49	0.961^{NS}
WK4	223.08±16.66	220.69±20.88	0.929^{NS}

WK1=Week1, WK2=Week2, WK3=Week3, WK4=Week4, NS=NotSignificant

Table 7: Breed effect on Linear body measurements

Parameters W-W(cm)	White Fulani	Muturu	P-Value
WK1	25.03±1.03	26.00±1.01	0.532^{NS}
WK2	26.96±0.98	26.91±0.99	0.972^{NS}
WK3	28.88±1.07	28.63±0.73	0.849^{NS}
WK4	30.38±1.51	29.15±0.71	0.471^{NS}
HIPL(cm)			
WK1	30.85±0.89	30.05±0.94	0.557^{NS}
WK2	33.67±1.08	34.58±1.09	0.557^{NS}
WK3	35.08±1.07	35.13±1.03	0.977^{NS}
WK4	36.38±1.28	36.18±1.22	0.915^{NS}
HIGHHIP(cm)			
WK1	10.25±0.23	10.08±0.26	0.628^{NS}
WK2	11.42±0.19	11.52±0.19	0.722^{NS}
WK3	13.67±0.43	14.38±0.59	0.338^{NS}
WK4	16.08±0.38	16.57±0.45	0.421^{NS}
WIDHEIGHT(cm)			
WK1	25.58±0.74	24.92±0.72	0.527^{NS}
WK2	27.42±0.87	26.83±0.74	0.615^{NS}
WK3	30.71±0.75	30.56±0.41	0.862^{NS}
WK4	31.58±0.76	31.40±0.46	0.839^{NS}

WK1= Week1, WK2= Week2, WK3= Week3 WK4=Week4, NS= Non Significant

The study investigated the effects of breed on body weight of White Fulani and Muturu cattle. The results revealed significant breed differences in body weight in the initial weeks of the study period. As for the body weight, the Muturu breed exhibited significantly higher means (180.65 220.69 kg) compared to the White Fulani breed (165.67-223.08kg) from weeks 1 to 4. This finding aligns with the study by (Olorunnisomo et al.,2021), who reported higher body weight means for Muturu cattle (170-210 kg) compared to White Fulani cattle (150-190 kg) in Nigeria. it was observed that Muturu cattle gained higher body weight means of (180-220 kg) than White Fulani cattle (160-200 kg) as reported by (Adeyinka et al., 2022). These differences in body weight between breeds could be attributed to genetic factors influencing growth rates and mature body sizes (Mwai et al., 2015).

Table 8: Breed effect on Glucose level of White Fulani and Muturu cattle

Parameter	White Fulani	Muturu	P-Value
Glucose(mg/u)	47.67±2.47	46.67±2.32	0.770NS

The Widther-Widther (W-W) for White Fulani ranges from 25.03 - 30.38cm. Muturu ranges from 26.00 - 29.15cm from week1 - week4. From weeks 2 - 4, White Fulani breed had significantly higher (p0.05) between the two breeds. Hip length (HL) for White Fulani ranges from 30.85 - 36.38cm and Muturu breed ranges from 30.05 - 36.18cm from week one to week four. White Fulani breed has stastiscally similar value to Muturu breed although there were no significant differences (p>0.05) in hip length between the two breeds. High hip (HH) for White Fulani ranges from 10.25 - 16.08cm. The Muturu breeds ranges from 10.08 - 16.57. From weeks 1 to 4. The White Fulani breed has stastiscally similar value to Muturu breed although there were no significant differences (p>0.05) in high hip between two breeds. Widther height (WH) for White Fulani ranges from from 25.58 - 31.58cm and Muturu breed ranges from 24.92 - 31. 40cm from week one to week four. At week 1and 2, White Fulani breed had significantly higher (p0.05) in Widther height between two breeds though White Fulani has stastiscally similar mean to Muturu breed. Although, Muturu breed exhibited significantly higher body weight compared to White Fulani breed during initial weeks, while the White Fulani breed had significantly higher Widther -Widther and Widther height during same period. However, these differences diminished towards the later weeks, with no significant.

Table 9: Interaction table between treatment and breed

Parameters(cm)	T1	T2	T3	T4	T5	T6	P-Value
BW1	120.75±0.95	205.25±32.06	171.00±5.45	167.52±37.74	166.23±28.46	208.28±12.01	0.169^{NS}
BW2	147.00±13.34	217.50±34.41	211.75±15.54	172.77±36.61	205.49±28.83	226.02±18.54	0.287^{NS}
BW3	154.75±11.43	222.25±32.81	235.25±26.70	184.16±38.93	184.17±31.67	247.73±27.63	0.244^{NS}
BW4	165.50±22.17^{b}	252.50±13.89^{ab}	251.25±26.65^{ab}	187.13±38.45^{b}	197.05±31.07^{ab}	277.89±26.45^{a}	0.059**
W-W1	22.75±0.25^{b}	27.50±1.50^{a}	25.00±2.38^{ab}	22.25±0.25^{b}	27.25±1.25^{a}	28.50±1.50^{a}	0.022**
W-W2	23.88±1.23^{b}	28.00±1.08^{a}	29.00±1.73^{a}	22.75±0.75^{b}	29.10±0.65^{a}	28.88±1.13^{a}	0.002**
W-W3	26.63±0.52^{bc}	28.50±1.21^{bc}	31.50±2.63^{a}	25.50±00^{c}	30.00±1.00^{ab}	30.38±0.13^{ab}	0.026**
W-W4	27.50±0.87	29.88±1.53	33.75±3.92	26.25±0.25	30.33±1.06	30.88±0.38	0.111^{NS}
HIPL1	29.75±0.25^{bc}	29.25±1.31^{bc}	33.55±1.83^{a}	29.75±0.25^{bc}	27.25±0.25^{c}	33.15±1.95^{ab}	0.014**
HIPL2	32.50±0.50^{b}	31.50±1.50^{b}	37.00±2.12^{a}	32.50±0.50^{b}	32.50±1.50^{b}	38.70±1.44^{a}	0.007**
HIPL3	33.25±0.75^{b}	32.75±1.27^{b}	39.25±1.31^{a}	33.00±0.71^{b}	33.38±1.32^{b}	39.00±1.41^{a}	0.001**
HIPL4	33.50±0.84^{b}	33.75±0.75^{b}	41.88±1.29^{a}	33.00±0.71^{b}	34.55±0.86^{b}	41.00±1.78^{a}	0.000**
Highhip1	9.75±0.25^{b}	10.50±0.29^{ab}	10.50±0.50^{ab}	9.75±0.25^{b}	11.00±0.00^{a}	9.50±0.50^{b}	0.043**
Highhip2	10.75±0.25^{b}	11.75±0.25^{a}	11.75±0.25^{a}	10.75±0.25^{b}	12.00±0.00^{a}	11.80±0.27^{a}	0.002**
Highhip3	14.50±0.87^{ab}	13.75±0.85^{ab}	12.75±0.25^{b}	16.00±1.00^{a}	14.75±0.75^{ab}	12.40±0.21^{b}	0.024**
Highhip4	17.25±0.63^{ab}	15.75±0.63^{bc}	15.25±0.25^{c}	18.25±0.75^{a}	16.00±0.41^{bc}	15.45±0.21^{c}	0.004**
WidHTH1	24.50±0.29^{b}	23.75±0.25^{b}	28.50±1.26^{a}	24.00±0.00^{b}	23.25±0.25^{b}	27.50±1.50^{a}	0.001**
WidHTH2	25.75±0.25^{b}	25.25±0.25^{b}	31.25±0.92^{a}	26.00±0.41^{b}	24.85±0.85^{b}	29.65±0.95^{a}	0.000**
WidHTH3	31.25±0.48^{a}	28.25±1.31^{b}	32.63±0.94^{a}	30.75±0.25^{ab}	30.05±1.13^{ab}	30.88±0.59^{ab}	0.050**
WidHTH4	31.25±0.48^{bc}	29.25±0.95^{c}	34.25±1.03^{a}	30.75±0.25^{bc}	30.95±1.25^{bc}	32.50±0.29^{ab}	0.008**
GLUCOSE	47.50±1.84^{b}	38.75±1.93^{c}	56.75±2.39^{a}	44.00±1.68^{bc}	39.75±2.02^{c}	56.25±1.79^{a}	0.000**

abc. Means± SEM on the row with different superscripts are significantly different (P<0.05).
BW = Body Weight, W-W = Widther-Widther, HipL, Hip Length, WidHTH = Widther Height
T1 = White Fulani on 0g probiotics, T2 = White Fulani on 5g probiotics, T3 =White Fulani on 10g probiotics, T4 = Muturu on 0g probiotics, T5 = Muturu on 5g probiotics, T6 = Muturu on 10g probiotics

differences observed between the two breeds for most parameters from weeks1 - 4. For Widther-Widther, the White Fulani breed demonstrated significantly higher means (25.03- 30.38cm) than the Muturu breed (26.00- 29.15 cm) from weeks 1 to 4. These result was consistent with the findings of (Egena et al., 2019), who reported higher Widther height means for White Fulani cattle (52-56 cm) compared to Muturu cattle (50-54 cm) in Nigeria. However, it was found there were no significant differences in widther height between Muturu and White Fulani cattle (Ojogho et al., 2023) thereby aligning with the results of this study. For Hip length, White Fulani breed exhibited significantly higher means for Hip length (30.85- 36.38cm) and high hip (10.25-16.08cm) compared to the Muturu breed (30.05-36.18cm and 10.08-16.57 cm, respectively) from weeks 1 to 4. These findings were supported by the study of (Adamu et al., 2020), who reported higher means for hip length (27-29 cm) and high hip(7.0-7.5 cm) in White Fulani cattle compared to Muturu cattle (24-26 cm and 4.0-4.5 cm, respectively) in Nigeria. Although, (Abubakar et al., 2018) found no significant breed differences in hip length between White Fulani and Muturu cattle in their study. Widther height for White Fulani breed demonstrated significantly higher means (25.03-30.38cm) compared to the Muturu breed (26.00-29.15cm) from weeks 1 to 4. These result were in alignment with the study of(Egwu et al., 2021) who reported higher Widther height for White Fulani cattle (6.0 6.5 cm) than Muturu cattle (4.5-5.0 cm).

The result on breed effect on gulucose level as presented the effect of probiotics (*Saccharomyces crervisea*) on the breed over a specific period (Table 8). The gulucose level ranges from (47.67 - 46.67mg/u). There were no significant difference (P>0.05) among the breed as indicated above. White Fulani has a higher mean value compared to Muturu cattle. The result of the study contradicted the report of Oikonomou et al. Who reported a significant influence of the glucose concentration of White fulani and Muturu breed. Additionally, Garverick et al. found greater blood glucose concentration in White Fulani cows that conceived at first insemination in comparison with Muturu cow of the same circumstance.

It was showed interaction effect of probiotics between the body weight and linear body measurement of both breed of cattle from week 1 to 4 (Table 9). T1 were White Fulani supplemented with 0g of probiotics, T2 were White Fulani supplemented with 5g of probiotics and T3 were

White Fulani supplemented with 10g of probiotics, T4 were Muturu cattle supplimented with 0g of probiotics, T5 were Muturu supplimented 5g of probiotics then the T6 group were the Muturu supplemented with 10g of probiotics. The body weight of White Fulani for T1 increaseed from 120.75 at week one to 165.50kg at week four. T2 body weight increased from 205.25kg at week one to 252.50kg at four week. T3 body weight increases from 171.00kg at week one to 251.25kg at four week. The body weight of Muturu (T4) increases from 167.52kg at week one to 187.13kg at four week. T5 body weight increases from 166.23kg at week one to 197.05kg at four week. T6 body weight increases from 208.28kg at week one to 277.89kg at four week. The mean body weight of Muturu cattle increased across all treatment group over the four week period. At week four, T6 (10g probiotics) had the highest mean BW of 277.89±26.45 kg, followed by T5 (5g probiotics) with 197.05±31.07kg, T4 (control) with 187.13±38.45kg.However, it indicated no statically significant differences among the treatment groups for BW at any time point ($p>0.05$). Also, in White Fulani the BW increased across all treatment groups over the period. The T2 had the highest mean BW of 205.25±32.06 kg, followed by T3 with 171.00±5.45 kg andT1 with 120.75±0.95kg also there were no statistically significant differences in body weight among the treatment groups (T1, T2, T3, T4, T5, T6 of neither breed) throughout the study period (weeks 1 to 3), except for week four where there was significant difference (O0.05) for control and treatment group (Göncü S et al., 2020) which showed no significant of BW. In contrast, this study showed lower mean body weight gains for both the T3 (171.00±5.45kg) and T5 (166.23±28.46kg) groups in White Fulani and Muturu breed. The Widther-Widther, hip length, high hip, and Widther height increases with age as seen from the gradual increase in the mean in table 9 In White Fulani the Widther-Widther for T1 varies from 22.75cm at week one to 27.50cm at week four, T2 varied from 27.50cm at week one to 29.88 cm at week four.T3 varied from 25.00cm at week one to 33.75cm at week four. In Muturu, T4 varied from 22.25cm at week one to 26.25cm at week four. T5 varied from 27.25cm at week one to 30.33cm at week four. T6 varied from 28.50cm at week one to 30.88cm at week four and there were statistically significant (P0.05) The hip length for T1 varied from 29.75cm at week one to 33.50cm at week four. T2 varied from 29.25cm at week one to 33.75cm at week four, T3 varied from 33.55cm at week one to 41.88 at week four, T4 varied from 29.75cm at week one to 33.00cm at week four, T5 varied from 27.25cm at week one to 34.55cm at week four, T6 varied from 33.15cm at week one to 41.00 at week four. There were highly significant differences in hip length among the treatment groups ($P< 0.05$) differences in widther height among the treatment groups from week one to four with T3 (10g probiotics) having significantly higher Widther height compared to other treatments (T1, T2 T4 ,T5, T6) Lukuyu et al., 2016, reported no significant differences in linear body measurements between local cattle supplemented with 5g of S. cerevisiae and the control group over an 8-week period. The mean values reported for Widther-Widther, hip length, and Widther height were 128.6 ± 5.2 cm, 15.9 ± 1.3 cm, and 26.8 ± 2.1 cm, respectively, for both the probiotic and control groups as found by. In this study, the mean values for these parameters in the Muturu breed at week 4 were 208.28± 12.01cm (T6 group) for Widther-Widther, 34.55±0.86cm (T5 group) for hip length and 30.95±1.25 and 32.50±0.29cm (T5 and T6 groups) for Widther height, which appear to be lower than the report of (Lukuyu MN et al., 2016). Likewise, no significant effect of S. cerevisiae supplementation (5g or 10g) on the linear body measurements of White Fulani cattle over a 10-week period was reported by (Oduguwa B.O et al., 2013). However, this report varies from the present findings, which showed that the administration of probiotics (*Saccharomyces cerevisiae*) appeared to have significant effects on linear body measurements, such as Widther-Widther, Hip Length, High hip, Widther height in both the White Fulani and Muturu cattle.

Conclusion

It was concluded that there were no significant differences in body weight and glucose levels among the treatment groups or between breeds, the administration of probiotics appeared to have significant effects on linear body measurements like Widther-Widther, hip length, high hip, and Widther height in both breeds. The Muturu breed exhibited higher body weight compared to the White Fulani breed during the initial weeks, while the White Fulani breed had higher measurements for some linear body parameters.

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