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# MILK YIELD AND COMPOSITION OF DAIRY ZARAIBI GOATS FED MICROBIAL INOCULATED CORN SILAGE

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## ABSTRACT

This experiment was conducted on Twenty-two dairy Zaraibi nanny goats to assess the effect of feeding either un-inoculated corn silage (UCS), or microbial inoculated corn silage (BICS) on quantity of feed consumption, live body weight, milk production, milk composition and some blood parameters. Zaraibi nanny goats were allocated in two treatment groups (n=11). The does were received diets from pre-mating up to end of lactation period. Nannies were similar in breeding season and production performance. The concentrate feed mixture (CFM) and wheat straw (WS) were fed as basal diet to the two experimental groups. The first group (G1) was fed basal diets + un-inoculated corn silage while, the second group (G2) nourished basal diets + microbial inoculated corn silage. The amounts of diets were adjusted according to NRC (2007) allowances. Both G1 and G2 were housed in separated pens under similar environmental condition. The salt blocks and fresh water were freely given throughout the experimental period. The results indicated that the average feed consumption of silage and total dry matter were increased for does fed BICS (G2) compared to those fed UCS (G1), while consumption of CFM and WS were not affected. There are no significant differences in live body weight changes between the experimental groups during different periods (from mating to post weaning). Yield of suckling and lactation milk was significantly (P<0.05) higher for G2 than G1.

Milk contents of protein and lactose during suckling and lactation periods were significantly (P<0.05) higher in G2. G2 also during suckling and lactation periods had significantly (P<0.05) higher hemoglobin, serum glucose, total protein, albumin and urea nitrogen than G1,. Serum globulin recoded booster level in G2 than G1 during suckling period (P<0.05). It is concluded that feeding microbial inoculated corn silage increased milk production, milk contents of protein and lactose and increased hemoglobin, serum glucose, total protein, albumin and globulin.

***Key words: Goats, microbial inoculant, corn silage, milk yield and composition, some blood parameters.***

## INTRODUCTION

Goats are important domestic animals in many parts of the world, because of their adaptability to different environmental conditions and utilizing poor quality feed stuffs. In Egypt, corn is considered the main important summer field crop that occupies large area of available cultivated lands. Corn silage is a well digestible and palatable high-quality forage crop, mainly used as silage, which of high energy, for dairy animals. Starch, in the kernels, optimizes the growth of rumen microbial population and influences the rate of microbial protein synthesis, nitrogen utilization and production of volatile fatty acids (Jalč *et al.*, 2009). Ensiling is the process of feed conservation with a minimal loss of nutritive value due to anaerobic fermentation of soluble carbohydrates to organic acids, preferably lactic acid, which reduces pH (Saarisalo *et al.*, 2007). Adogla-Bessa and Aganga (2000) found that supplying the right amount of corn silage, improved production and reproduction of livestock. Corn silage can be an economic source of nutrients for domestic animals, especially on large farms where feeding can be mechanized (Oelker *et al.*, 2009). Silage inoculants are usually added to improve silage fermentation and to obtain silage with high nutritive value with minimum dry matter (DM) losses (Hristov and McAllister, 2002). Wrobel and Zastawny (2004) explained that bacterial inoculants improved fermentation which evident by a rapid decline in pH, high concentration of lactic acid and low ammonia nitrogen content. Also they reported that, silage fermentation has a major effect on feed intake, nutrients utilization and milk production of ruminants. Huhtanen *et al.* (2003) recorded that changes in milk composition will be reflected on the nutritional, technological and economic values of goat's milk as well as of other dairy products. Varadyova *et al.* (2010) concluded that supplementation of sunflower oil into inoculated maize silage had in vitro technique boost effects on gas production and volatile fatty acids concentration. Also, Adesoji *et al.* (2010) reported that microbial inoculants of silage is advantageous because it is safe, easy to use, not corrosive to machinery and do not pollute the environment. Constructively, Nkosi *et al.* (2011) observed that intake and digestibility of dry matter, organic matter, crude protein and fiber and nitrogen retention were improved when rams fed bacterial inoculated corn silage.

Therefore, this study was carried out to assess the effect of feeding microbial inoculated corn silage (BICS) on feed consumption, live body weight, suckling and lactation milk production and blood parameters for diary Zaraibi goats.

## MATERIALS AND METHODS

This study was conducted at El-Serw Experimental Research Station, belongs to Animal Production Research Institute, Agriculture Research Center, Ministry of Agriculture, Egypt.

### Silage making

Whole corn plants at doughy stage of maturity were chopped 1-1.5 cm length and ensiled in two heaps. The first heap was un-inoculated corn silage (UCS) and the second heap was inoculated with the microbial inoculant (MID/1), which contains live lactic acid producing bacteria of *Lactobacillus planetarium* and *Enterococcus faecium* and strains of anaerobic cellulotic bacteria that selected to assist in ensiling of whole plant corn silage (microbial inoculated corn silage (BICS) as described by Hafez, *et al.*(2012).

### Experimental animals

Twenty-two Zaraibi nanny goats were selected similar in lactation season and milk yield. The live body weight and age of does were 41.23 – 42.52 Kg and 2.9-3.3 years, respectively. All does were of good productive and reproductive performance and housed in separated pens under similar environmental condition.

### Animals feeding and management

The does were allocated into two groups (n=11). The concentrate feed mixture (CFM) and wheat straw (WS) were presented as basal diet to the two experimental groups. Besides, the control group (G1) does had received un-inoculated corn silage (UCS), while the other group (G2) nourished biological inoculated corn silage (BICS). The quantities of experimental diets were offered 21 days before pre-mating as flushing rations and continued until end of lactation season. The nutrients requirements of does were adjusted during experimentation according to NRC (2007). Rations were offered in two parts at 8 am and 3 pm daily. Salt blocks were available continuously and fresh water was given freely throughout the experimental period. The CFM and feedstuffs were analyzed according to A.O.A.C. (1995). Contents of neutral detergent fiber (NDF) and acid detergent fiber were analysis using method of Goering and Van Soest (1970). The ashing and minerals were prepared according to Krishna and Ranjhan (1980). Contents of calcium (Ca), phosphorus (P), magnesium (Mg), sodium (Na), and potassium (K) were determined applying Spectrophotometer. Zinc (Zn), ferrous (Fe), manganese (Mn), and copper (Cu) were measured using Atomic Absorption Spectrometer (Perkin Elemer, model 10LOB). The chemical compositions of experimental diets are recorded in Table 1.

The quantity of offered feed and the residual diet were measured to determine feed intake during pre-mating, gestation, suckling and lactation periods.

Changes in live body weight was assessed individually every two weeks, whereas live body weight was recorded for does before morning feeding during pre-mating, post-mating at day 42, trimester of pregnancy, post-kidding and post-weaning.

**Table 1: Chemical composition, cell wall constituents and minerals content of the feedstuffs.**

| Items<br>Component,% | Chemical composition of experimental feeds (as DM basis) | | | |
|---|---|---|---|---|
| | *CFM | WS | UCS | BICS |
| **OM** | 93.30 | 83.19 | 91.53 | 90.72 |
| **CP** | 15.24 | 3.42 | 8.57 | 10.86 |
| **CF** | 14.91 | 36.51 | 27.58 | 26.76 |
| **EE** | 3.42 | 1.81 | 3.11 | 3.35 |
| **NFE** | 59.73 | 41.45 | 52.27 | 49.75 |
| **Ash** | 6.70 | 16.81 | 8.47 | 9.28 |
| **NDF** | 45.85 | 73.51 | 41.25 | 38.61 |
| **ADF** | 15.26 | 51.33 | 24.65 | 22.53 |
| **Minerals contents** | | | | |
| **Macro, %** | | | | |
| **Ca** | 0.87 | 0.22 | 0.25 | 0.42 |
| **P** | 0.98 | 0.07 | 0.23 | 0.38 |
| **Mg** | 0.44 | 0.13 | 0.16 | 0.23 |
| **Na** | 1.57 | 0.15 | 0.02 | 0.08 |
| **K** | 0.67 | 1.28 | 1.06 | 1.65 |
| **Trace, ppm** | | | | |
| **Zn** | 24.00 | 11.14 | 21.82 | 31.69 |
| **Fe** | 58.00 | 113.24 | 73.74 | 83.84 |
| **Mn** | 74.00 | 28.12 | 14.85 | 22.91 |
| **Cu** | 4.11 | 3.15 | 6.81 | 9.56 |
| ****GE kcal / Kg DM** | 4280 | 3599 | 4090 | 4104 |

CFM= Concentrate feed mixture. WS= Wheat straw. UCS= Un-inoculated corn silage. BICS= Biological inoculated corn silage.
*CFM consisted of : 25% undecorticated cottonseed meal, 39% yellow corn, 7% soybean meal, 20% wheat bran, 5% molasses, 2.5% limestone, 1.0% common salt and 0.5% minerals mixture.
** Gross energy (GE) calculated according to Blaxter(1966).

**Milk yield**

New-born kids were kept with mothers till weaning (90 days), except during time of milk yield recording. During suckling period, milk yield was recorded twice daily at days 15, 30, 45, 60, 75 and 90th for all does using oxytocin method while separating kids from mothers. The first time was from 10:00 am to 2:00 pm while the second time from 5:00 pm to 9:00 pm within the same day. Oxytocin method was administered during separation, where double doses of oxytocin was injected into does after kids separation. The first oxytocin dose (2 I.U. / doe) was injected intravenous then waiting a minute to empty the udder of residual milk, using hand milking. This milk amount was discarded. After 4 hours elapsed for kids separation, the second oxytocin dose (2 I.U. / doe) was injected. Then udder was milked and yield was recorded. The suckling milk yield of G1 and G2 during 24 hours was estimated by multiplying the actual milk yield obtained during the 8 hours by 3.

Post-weaning, starting from day 90, daily milk was recorded biweekly for all does by gathering milk harvested at 5 am and 5 pm. The two periods represent the whole daily milk produced from both G1 and G2.

**Milk composition**

Milk samples (about 0.5% of total milk produced) were taken biweekly from does of both G1 and G2 during suckling and lactation. Milk samples were composed and analyzed for chemical composition according to Bradley *et al.* (1992).

**Blood sampling and analysis**

Jugular blood samples were taken from G1 and G2 does once monthly during suckling and lactation period. Samples were collected in test tube contained EDTA at morning before offering feed. Hematological measures applied on all blood samples immediately after collection. The other blood samples were separated by centrifuging at 3000 rpm for 15 min. The blood serum was collected and frozen at -20$^{o}$C until analysis. Commercial kits were used for all blood measures.

**Statistical Analysis**

Obtained data were subjected to statistical analysis using general linear models (GLM) procedure of SAS (2009) and significance was declared at P<0.05.

## RESULTS AND DISCUSSION

**Feed consumption**

The daily feed intake for G1 and G2 through pre-mating, trimester of gestation, suckling and lactation periods are shown in Table 2. Consumption of corn silage was increased by 18, 27, 27 and 37% during pre-mating, trimester of gestation, suckling and lactation periods for does fed BICS (G2) than those fed UCS (G1), respectively. Also total dry matter intake, consumption of concentrate feed mixture (CFM) and wheat straw (WS) had exhibited the same trend. Corn silage consumption and total roughage percentage were increased for G2 compared with G1, while CFM contrarily decreased. The dry matter intake (DMI) is a function of meal size and meal frequency that are determined by animal and dietary factors affecting hunger and satiety. The results of this study are similar to those reported by Johnson *et al.* (2003) that hybrid, maturity, and moisture content at feeding are known indicators of the nutritional value of corn silage. The consumption of diet by G2 compared with G1 was related to enhancing fiber content that assumed as result of increased DMI. Fiber intake is defined as the part of diet that stimulates chewing activity and buffer saliva production. These results are in agreement with Krause *et al.* (2002) who suggested that fiber content of diet is a primary factor affecting chewing activity and believed to be indicator of rumen health and function. Does in G2 had the highest and greater neutral detergent fiber (NDF) digestibility which may increased DMI. Similarly, Kendall *et al.* (2009) reported that cows demonstrated more consumption of DMI when corn silage have greater NDF digestibility. Zali and Ganjkhanlou (2009) found that zinc supplement to diet increased dry matter intake by 11.3% for ewe receiving augment zinc than control. On the other hand, Vatandoost *et al.* (2011) found that lactating dairy cows showed increase in growth rate when using bacterial inoculation which affect through changes in feed intake, nutrients digestion and suggesting that its response may be related to improved efficiency of metabolisable energy utilization.

**Table2: Average daily feed consumption of G1 and G2 from prior-mating to lactation period.**

| Item | Experimental groups | |
|---|---|---|
| | G1 | G2 |
| **Daily dry matter (g/h) - during pre-mating period** | | |
| **CFM** | 856 | 851 |
| **Silage** | 487 | 575 |
| **wheat straw** | 396 | 392 |
| **Total dry matter intake** | 1739 | 1818 |
| **Silage consumption, %** | 28.00 | 31.66 |
| **Total roughage, %** | 50.78 | 53.19 |
| **Daily dry matter (g/h) – trimester of gestation** | | |
| **CFM** | 892 | 891 |
| **Silage** | 266 | 337 |
| **Wheat straw** | 385 | 371 |
| **Total dry matter intake** | 1543 | 1599 |
| **Silage consumption, %** | 17.34 | 21.08 |
| **Total roughage, %** | 42.19 | 44.28 |
| **Daily dry matter (g/h) – suckling** | | |
| **CFM** | 958 | 956 |
| **Silage** | 461 | 586 |
| **Wheat straw** | 405 | 415 |
| **Total dry matter intake** | 1824 | 1958 |
| **Silage consumption, %** | 25.27 | 29.93 |
| **Total roughage, %** | 47.48 | 51.12 |
| **Daily dry matter (g/h) - during lactation period** | | |
| **CFM** | 878 | 873 |
| **Silage** | 378 | 516 |
| **Wheat straw** | 386 | 391 |
| **Total dry matter intake** | 1642 | 1780 |
| **Silage consumption ,%** | 23.02 | 28.99 |
| **Total roughage, %** | 46.53 | 50.96 |

**Live body weight**

Results in Table 3 show that changes in live body weight (LBW) of G1 and G2 during mating, trimester of gestation, post kidding and post-weaning periods did not resulted significant difference in BW between G1 and G2 among all stages studied.

**Table 3: Body weight changes for G1 and G2 pre-mating up to 180 days post weaning.**

| Items | Experimental groups | |
|---|---|---|
| | G1 | G2 |
| **Live body weight (kg) during mating season** | | |
| **Pre-mating** | 41.7±0.24 | 42.5±0.23 |
| **Post-mating** | 44.6±0.28 | 45.8±0.33 |
| **Live body weight during (kg) trimester of gestation** | | |
| **At 90 days** | 49.5±0.27 | 51.8±0.45 |
| **At 120 days** | 52.4±0.40 | 54.6±0.40 |
| **At 150 days** | 55.4±0.44 | 56.8±0.53 |
| **Live body weight (kg) post-kidding** | | |
| **Post-kidding** | 43.6±0.32 | 43.8±0.42 |
| **At 30 days** | 41.6±.024 | 42.7±0.35 |
| **At 60 days** | 40.4±0.36 | 41.9±0.42 |
| **At 90 days** | 40.1±0.22 | 41.5±0.27 |
| **Live body weight (kg) post-weaning** | | |
| **At 120day** | 40.5±0.30 | 41.7±0.37 |
| **At 150 days** | 41.4±.021 | 42.5±0.41 |
| **At 180 days** | 40.6±0.34 | 42.6±0.38 |
| ***Live body weight %** | 93.1 | 97.3 |

*Live body weight %= live body weight at day 180 / live body weight post- kidding x100.

The same trend was reported by James and Osinowo (2004). Concerning the inoculated silage by MID/1®, the obtained results indicate sufficient dry matter intakes that improve body weight. Adogla-Bessa and Aganga (2000) found that dry matter intake for does offered high-energy diet were equivalent to 5% of their body weight, while intake of low energy diet equivalent to 3.3% of body weight. Increasing energy level in BICS ration, thus energy consumption, could share the increase of body weight. As stated by Salam (2009) ration of high energy increased the amount of protein synthesis in body that creates growth which manifested as increase in body weight. The more minerals levels offered to G2 may affected LBW changes. These results are in accordance with Pechova *et al.* (2011) who indicated that zinc ranks among the essential microelements that influence metabolism, the immune system and can improve a number of health disorders that caused positive reflection on LBW. Generally, these results show a positive LBW for dairy does maintained when BICS diet presented, especially during mating season, last 2 months of pregnancy, suckling and lactation.

**Evaluation of suckling and lactation milk**

Milk production during suckling period (first 90 days) is demonstrated in Fig.1. The average suckling milk yield during assessment days was significantly ($P<0.05$) higher in G2 (1544.5 gm) than G1 (1404 gm). This increase may be due to that G2 received higher energy content and intake trough ration than G1. In any event, better milk yield with BICS during sucking and lactation periods than UCS may be related to enhancing VFA'S. This result confirms with Hafez *et al.* (2012) who noticed that BICS contained higher total volatile fatty acids (3.00%), acetic (1.15%), propionic (0.85%), butyric (0.35%) and valeric acid (0.12%) than un-inoculated, 2.75, 0.99, 0.66, 0.25 and 0.09%, respectively. This result is consistent with Tag-El-Din (2000) who studied the effect of different energy levels on milk yield of Sudanese Nubian goats and found it increased with increasing energy level. Also, these results agree with the findings of Tovar-Luna *et al.* (2010) whom stated that increased energy level in does ration increased the amount of lactate acid in rumen which has role on producing milk thus affect kids' growth from birth to weaning. The highest level of minerals in inoculated corn silage fed to G2 may played an important role on milk production. This is corresponding to Bawala *et al.* (2006) who reported that milk yield increased with increasing level of minerals sucked as Ca, P and Mg and slightly of K, in diets.

Fig.1 revealed higher milk yield for does in G2 over all lactation period. The peak of lactation as the lowest milk yield were of higher values with G2 (1695 and 788 gm/h/d) compared to G1 (1522 and 615 gm/h/d), respectively. Microbial inoculate addition in silage corn showed improvement in feed intake, nutrients digestion, milk production and composition (Atasagly *et al.*, 2008 and Lehloenya *et al.*, 2008).The highest milk production of does fed biological inoculated corn silage might be attributed to its positive effect on nutrients. These results are in agreement with those obtained by Canizares *et al,* (2011) who observed that feeding dairy goat inoculant-treated silage achieved higher DM intakes and yet higher milk yield compared to those fed untreated silage. Moreover, may be the higher blood glucose, total protein and albumin concentration with goats received BICS (Table 5 ) help to enhance milk lactose synthesis and consequently increase milk yield (Lohrenz *et al.,* 2010). Generally, ensiling process has shown to alter silage composition and improve digestibility of silage by ruminal microorganisms. This also seems to be the case with increasing energy intake. Similarly, Morand-Fehr *et al.* (2000) recognized that a higher level of energy intake leads to greater production of milk by the animal. Moreover, the same authors observed that animals with low production capability, an increase in energy intake may sometimes give rise to higher levels of milk production, while in other animals cases the milk produced show higher proportions of fat and protein. The increase in milk fat secretion could be due to the higher availability of milk fat precursors such as butyrate and long-chain fatty acids (Schmidely *et al.,* 2005). Energy deficient diet decreased milk production and protein content whereas fat content increased as did the proportion of oleic acid and the sum of n-3 fatty acids (Morel *et al.*, 2010).

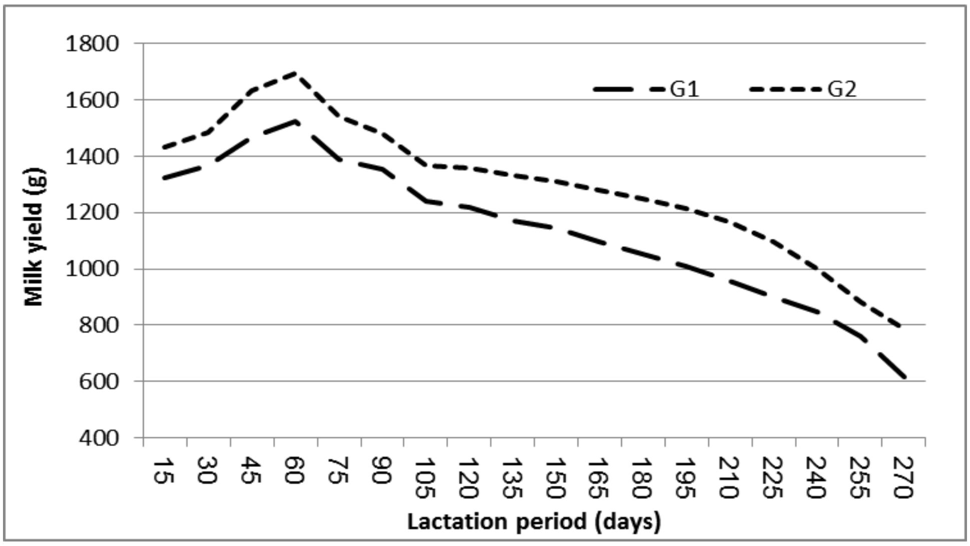


**Fig. (1) Lactation curve of dairy Zaraibi goats fed UCS and BICS**

**Milk composition during suckling and lactation period**

Milk composition of does was affected by feeding UCS and BICS as noticed in Table 4. Milk composition was differed significantly (P<0.05) among the two animal groups in percentage of protein and lactose during suckling and lactation periods. However, the other milk components in either G1 or G2 were not significantly different. As mentioned, differences in chemical factors between UCS and BICS diets may caused different effects on animal rumen. Increasing protein % in G2 than G1 during suckling and lactation periods may be attributed to supplement with microbial inoculate that enhanced amino acid and stimulate rumen that caused alteration in microbial protein synthesis and increased protein passage, yet protein milk content. Park (2007) reported a positive correlation between essential amino acids uptake and their demand for milk protein synthesis in the mammary gland. On the other hands, Rius *et al.* (2010) observed increase in milk protein yield for cows fed protein deficient but high energy diets. Lactose content in milk had increased in G2 as a result of adding microbial inoculate which may be due to the positive effect of BICS on the metabolic process in rumen, liver and mammary gland that played an important role on synthesis of lactose in milk. As shown in Table 5 there are accretion in blood content of glucose and total protein for does fed BICS compared with those fed UCS. Generally, milk protein and lactose are highly sensitive milk component to changes in nutrition of animals (Pulina *et al.*, 2008). Also, Jančik *et al.* (2009) concluded that addition of bacterial inoculants had beneficial effect on fermentation and nutritive qualities of silage which could indicate by a high lactic acid production, while low pH value and NH3-N, and high crude protein content and low cell wall component contents *i.e.* NDF, ADF and hemicelluloses compared to un-inoculated silage. In addition, the higher concentration of lactic acid in silage may have been metabolized into propionic acid by rumen microorganisms. Propionic acid is then absorbed into blood stream via rumen wall and converted to glucose in liver. The glucose formed used by animal as energy source for maintenance, production and reproduction activities (Hariadi and Santoso, 2010). On the other hand, Varadyova *et al.* (2010) concluded that bacterial inoculants additives can positively affect silage quality and, enhance sheep milk production. An appreciable effect of silage inoculation on animal performance has been also observed. For example, feed intake, live-weight gain, feed conversion efficiency and milk production in cows were improved as reported by Vakily *et al.* (2011).

## Blood profile during suckling and lactation periods

Data in Table 5 explain that G2 had significantly (P<0.05) higher contents of hemoglobin, serum glucose, total protein, albumin and urea nitrogen than G1, during suckling and lactation periods. Also, globulin had recoded higher (P<0.05) level with G2 than G1 during suckling period. The quantitative and qualitative parameters of milk production of dairy goats depends on nutritional supply and blood constituents. Gupta *et al.* (2007) found that cells of lactating mammary glands utilize as much as 80 % of available nutrients for synthesis of milk from blood. Moreover, examining blood for constituents is used to monitor and evaluate health and nutritional status of animals. The primary precursors of milk constituents includes free amino acids, glucose, acetate, fatty acids and triacylglycerols, from which milk proteins, lactose and fat are produced. Limitation in any of these will reduce milk production and change its composition (Tambuwal *et al.,* 2002).

**Table 4: Milk composition of the experimental groups during suckling and lactation periods.**

| Item | Experimental groups G1 | G2 |
|---|---|---|
| **Milk composition during suckling period (%)** | | |
| **Fat** | 3.33±0.06 | 3.49±0.05 |
| **Protein** | 2.98±0.03 [b] | 3.22±0.03 [a] |
| **Lactose** | 4.61±0.02 [b] | 4.87±0.02 [a] |
| **Total solids** | 11.65±0.07 | 12.33±0.04 |
| **Solids non fat (SNF)** | 8.32±0.04 | 8.84±0.05 |
| **Ash** | 0.73±0.02 | 0.75±0.01 |
| **pH** | 6.62±0.03 | 6.68±0.02 |
| **Acidity** | 0.15±0.00 | 0.18±0.00 |
| **Milk composition during lactation period (%)** | | |
| **Fat** | 4.06±0.06 | 4.24±0.04 |
| **Protein** | 3.01±0.03 [b] | 3.23±0.03 [a] |
| **Lactose** | 4.62±0.03 [b] | 4.89±0.04 [a] |
| **Total solids** | 12.44±0.012 | 13.12±0.06 |
| **Solids non fat (SNF)** | 8.38±0.07 | 8.88±0.02 |
| **Ash** | 0.75±0.02 | 0.76±0.03 |
| **pH** | 6.63±0.03 | 6.69±0.04 |
| **Acidity** | 0.16±0.00 | 0.19±0.00 |

a, b. Means within rows with different superscripts are significantly different (P < 0.05).

Increasing intake of digestible crude protein or digestible crude protein/MJ of metabolizable energy increases the urea content in blood and milk (Balikci *et al.,* 2007). Also, the content of calcium, magnesium, phosphorus and other minerals in BICS used for goat feeding is usually sufficient and higher compared with UCS fodder. Goats with high milk yield, during lactation as well as kids have to be given mineral mixtures (Begum *et al.*, 2010).

**Table 5: Blood profile for the experimental groups during suckling and lactation periods.**

| Blood analysis | Experimental groups | |
|---|---|---|
| | **G1** | **G2** |
| **Suckling periods** | | |
| **Hemoglobin, g/dl** | 13.53±0.41[b] | 15.76±0.54[a] |
| **Glucose, mg/dl** | 64.24±1.12[b] | 72.45±0.81[a] |
| **Total protein, g/dl** | 6.68±0.36[b] | 7.59±0.67[a] |
| **Albumin, g/dl** | 3.43±0.19[b] | 3.82±0.13[a] |
| **Globulin, g/dl** | 3.25±0.34[b] | 3.85±0.51[a] |
| **Urea-N, mg/dl** | 12.31±0.43[b] | 16.57±0.34[a] |
| **AST, u/l** | 68.15±3.36 | 72.75±3.12 |
| **ALT, u/l** | 14.73±0.75 | 16.55±1.03 |
| **ALP, u/l** | 105.46±5.42 | 96.59±5.41 |
| **Cholesterol, mg/dl** | 113.35±4.41 | 115.11±6.25 |
| **Lactation periods** | | |
| **Hemoglobin, g/dl** | 11.55±0.31[b] | 13.78±0.44[a] |
| **Glucose, mg/dl** | 65.35±1.01[b] | 71.69±0.98[a] |
| **Total protein, g/dl** | 6.89±0.33[b] | 7.46±0.55[a] |
| **Albumin, g/dl** | 3.52±0.18[b] | 3.91±0.10[a] |
| **Globulin, g/dl** | 3.39±0.21 | 3.58±0.46 |
| **Urea-N, mg/dl** | 13.52±0.46[b] | 17.46±0.51[a] |
| **AST, u/l** | 69.01±2.33 | 73.01±2.11 |
| **ALT, u/l** | 13.56±0.78 | 15.11±1.01 |
| **ALP, u/l** | 106.01±4.61 | 98.11±4.11 |
| **Cholesterol, mg/dl** | 112.11±4.54 | 114.51±7.54 |

a, b . Means within rows with different superscripts are significantly different ($P < 0.05$).

## CONCLUSION

It could be concluded that microbial inoculated corn silage is preferable as dairy goat's ration during pre-mating, trimester of pregnancy, suckling and lactation. BICS has a positive role in enhancing forage intake, live body weight, milk yield and milk composition.

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# الملخص العربى

## إنتاج و تركيب لبن االماعز الزرايبى الحلابه المغذاه على سيلاج الذرة المعامل ميكروبيا

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أجريت هذه التجربة على اثنين وعشرون عنز زرايبى حلابة بهدف معرفة تاثير التغذية على سيلاج الذرة الملقح ميكروبيا بالغير ملقح وأثر ذلك على كمية إستهلاك العلف، وزن الجسم، إنتاج اللبن، مكونات اللبنوبعض مكونات الدم. تم تقسيم الماعز الى مجموعتين كل من 11 عنزة متماثلة في الموسم والأداء الإنتاجى. وغذيت الماعزقبل موسم التلقيح وحتى نهاية الحليب. شكل العلف المركز وتبن القمح العليقة الأساسية المقدمة لكل المجاميع حيث تم تغذية المجموعة الأولى G1 على العليقة الأساسية + سيلاج الذرة الغير ملقح ميكروبيا و المجموعة الثانية G2 على العليقة الأساسية + سيلاج الذرة ا لملقح ميكروبيا وتم ضبط كميات العلف والسيلاج حسب المقررات الغذائية NRC . تم إيواء كل من G1 و G2 في حظائر منفصلة تحت ظروف بيئية متماثلة، ووفرت قوالب الملح ومياه الشرب النظيفة طوال فترة التجربة.

أشارت النتائج إلى أن استهلاك G2 كان اعلى من G1 اثناء الدفع الغذائى قبل موسم التلقيح ، والثلث الأخير من الحمل، وبعد الولادة، وفترة الرضاعة والحليب. ومتوسط انتاج اللبن ومكوناته اثناء الرضاعة والحليب كانت عالية معنويا مع G2 (P <0.05) مقارنة بمجموعة G1. كانت G2 عالية المعنويا (P <0.05) فى مستوى الهيموجلوبين والجلوكوز ، البروتين الكلي ، الألبيومين واليوريا في الدم من G1خلال الرضاعة وفترات الحليب ، كذلك أرتفع مستوى الجلوبيولين في الدم معنويا مع G2 بمقدار (P <0.05) عنG1 . وخلصت النتائج الى أفضلية استخدام سيلاج الذرة المعامل بيولوجيا لتحسين الأداء الأنتاجى والتناسلى للماعز الحلاب.

**نستنتج من النتائج أن معاملة سيلاج الذرة ميكروبيا أدت إلى زيادة المأكول من السيلاج و زيادة محصول و تركيب اللبن خلال المراحل المختلفة .**