*Zag. Vet. J. (ISSN. 1110-1458) Vol. 33, No. 1 (2005) PP.217-224*



# Effect of Protexin and Biomix supplement to the diet of lamb on their growth performance and ruminal juice contents during the green and dry seasons

**Hayam Mahmoud Samy* and Abdel Khalek El-Sheikh****

**Dept. of Nutrition and Clinical Nutrition, Fac. of Vet. Med., Suez Canal University*

***Dept. of Animal Medicine, Fac. of Vet. Med., Zagazg University*

## ABSTRACT

Twenty-four Balady lambs (6-7 month old) were divided into 6 equal groups (gps. 1-6). Gps.(1-3) were used during the winter season.Gp (1) was the control, gps (2 & 3) were supplied with Protexin and Biomix, respectively. Gps (4-6)were used during the dry season. Gp4 was the control. Gps (5&6) were supplied with Protexin and Biomix, respectively. The experiment lasted for seven weeks.The control groups were fed on a non additive basal diet .The other two probiotic treated groups were fed on a basal diet supplemented with 5 g Protexin per head per day or 0.5 g/Kg of concentrate mixture Biomix.

The average daily gain and weight gain % were higher in gps (2,3,5&6) than the control gps and the feed conversion was improved . Biomix gave the best results during the dry season and Protexin during the green season. Both probiotics did not affect the physical characteristics of the rumen juice (color, odor and consistency) and protozoal activity as well as sedimentation activity test (SAT), besides the Indol test and hydrogen sulphide ($H_2S$) test.

It was found that the microflora (numbers and population), total volatile fatty acids (TVFA) and ammonia concentration, in the rumen juice, were significantly increased at the fourth and seventh weeks in the supplemented groups during the dry and green seasons. The highest numbers of microflora and TVFA were recorded with Protexin during the dry and green season, respectively. Meanwhile, the pH levels were non significantly decreased in both the fourth and seventh weeks, with both additives during the dry and green feeding.

It could be concluded that the addition of probiotics (Protexin or Biomix) has a beneficial effect on the body performance, feed conversion and ruminal juice contents.

## INTRODUCTION

Nutrition plays an important and major role in animal production. Biobiotic which is a growth promoters and a support for intestinal microflora. It may help in overcoming the deleterious effects of many stress and nutritional status.

The ruminal microorganisms play an important role in ruminal digestion specially the fibrous carbohydrates that producing volatile fatty acids which help in animal production of energy, body fat and glycogen.

Concerning the physical properties of normal rumen juice, The normal color was olive green to grey green, of aromatic odor and slimy in consistency. The sedimentation activity test (SAT) was 28±1.14 per minutes in rumen juice obtained from sheep on green ration *(1)* .

Concerning the effect of probiotics on the animal, it improves the gastrointestinal tract status, intestinal microbial development and the quality of life *(2)* as well as controlling the intestinal infections of the livestock *( 3)* so that further information of the efficiency of such probiotics should be done, therefore, the main objective of this study was designed to evaluate the relative effect of Protoxen and Biomix supplement on growth performance and rumen fermentation pattern in lambs fed on green or dry diet.

## MATERIAL & METHODS

### Animals:

Twenty-four Balady lambs (6-7 month old, 28.8Kg average body weight and free from parasites) were divided into 6 equal groups (gps. 1-6). Gps (1-3) were used during the winter season and gps. (4-6) were used during the summer season . Gp.(1) was the control, and gps.(2-3) were supplied with Protexin and Biomix, respectively for seven weeks. Gp. (4)was the control for the dry

season.. Gps. (5-6) were supplied with Protexine and Biomix respectively for seven weeks. This work was done in the Faculty of Veterinary Medicine, Zagazig University.

**Diet:** It was formulated according to the requirements stated by the NRC *(4).* The diet was composed of berseem-hay and commercial concentrate during the dry season. Green berseem and commercial concentrate were used during the green season (table1). Two types of Probiotics (Protexin and Biomix )were added to diets

1- **Protexin:** It is a palatable probiotic formula containing live protected micro-organisms (streptococcus faecium, S. thermophilus, Lactobacillus plantarum, L.casei, L.bulgaricus, L.acidophilus, Bifidobacterium bifidum, Aspergillus oryzai, Torulopsis spp.). It is produced by Probiotic International limited, United Kingdom. It was used as 5g /animal/day dissolved in water and was given per os.

2-**Biomix:** It is imported by Monovet Co. It contains (in %) Mannan oligosaccharides 20, Bacillus subtillus 1.5, Aspergillus oryzae 1.5, Fermented grains and grain products 7 besides Diabond (clay) 25 and Agsorb 45 %. The fermentation products, contained in one Kg, : alpha amylase enzyme 1150000 units, Crude protein 2.5%, vitamins A; 800000IU, E;800 mg, $B_1$; 11 mg,$B_2$; 25 mg and $B_6$, 11mg. It was used as 0.5g mixed with one Kg concentrate.

The daily ration was offered in two equal portions. Fresh clean water was freely available

The live weight was recorded on the first day of the experiment and at the end. The average feed intake, average daily weight gain, % of weight gain and feed conversion ratio were calculated.

**Ruminal samples:** Ruminal samples were collected from each lamb by a simple rubber tube (16 mm diameters connected with a suction plastic syringe 100 ml capacity). The samples were collected at the beginning, after the fourth and seventh weeks of the experiment. Each sample was collected into a clean and dry sterile flask, sieved and strained through 4 folds of sterile gauze then divided into three portions, one part was taken in a clean and dry test tube for detecting the color, odor and consistency. The second part was used immediately for estimating the ruminal pH ( by electric pH meter) besides ammonia *( 5 )*, protozoal motility *(6)* , indol *(7)* and hydrogen sulphide *(8).*The third portion was used for the determination of TVFA by steam distillation method *(9).*

**Statistical analysis:**

All the data were subjected to statistical analysis using MSTAT-CV computer program 1988**(10).**

## RESULTS AND DISCUSSIONS

Nutrition commands the greatest attention for the growth performance because livestock producer can alter nutrition for extensive production. Feed additives and biobiotics could hasten the growth rate in ruminants and accomplish the intensive management situation. Protexin and Biomix are two groups of such additives and biobiotics.

Table (2) present the initial, final body weight, average daily gain and weight gain % besides the dry matter intake and feed conversion.

It was found that the DM intake, during the experimental period, did not differ between the supplemented groups. However, the average daily gain and weight gain % were higher by Protexin and Biomix supplement than the control non-supplemented groups. Protexin-fed lambs tended to gain more weight than the Biomix group. This resulted in a higher final weight during the green season. Meanwhile the body weight gain % recorded the highest level with the Biomix supplemented group during the dry season.

The feed conversion was improved by Protexin and Biomix feeding. It was 8.05 for Protexin and 10.88 for Biomix compared to 14.8 for the control group during the green season. It was 9.72, 11.86 and 14.8 in Biomix,

Protexin and control groups, respectively during the dry season. Similar improvement of the average daily gain and feed efficiency, after using Lasolacid or Monensin in sheep, was previously recorded *(11)*. This may be attributed to a change in the molar proportion of VFA toward more propionate and less acetate that led to an increase in the efficiency of converting feed energy in the acid end products available for absorption *(12)*.

The improvements of feed efficiency, weight gain and the average daily gain were strongly supported by *(13)* and *(14)*.They defined the probiotics as a live microbial feed supplements. The probiotics improve the intestinal microbial balance and maintain the optimal condition of the beneficial microorganisms within the gastrointestinal tract. They inhibit the growth of the pathogenic and undesirable bacteria; resulting in a reduction of the enteropathogenic disorders and increasing the food conversion and live weight gain. However, the probiotics showed no effect when the concentrates were removed from the diets of the sheep *(15)*. The addition of the concentrate mixture in diets of lambs was helpful for berseem and hay degradation (table 1,2) as well as growth performance (table 3). Furthermore, the effect of yeast on VFA proportions was a consequence of the effect of yeast on the microbial numbers in the rumen rather than a direct effect of the yeast, that might help to explain the weight gains *(16)*. Moreover, the yeast culture was associated with an increased flow of microbial protein leaving the rumen and enhancing the supply of amino acids entering the small intestine in dairy cows *(17)* increasing protein intake and body weight gain.The probiotics increased the digestibility and degradation of plant cells by bacterial and protozoal activities in the rumen of sheep. They increased total retention of the solid particles in the whole digestive tract resulted in more production and absorption of the protein that increased the growth rate *(18, 19)*.

Moreover, An improvement of NDF digestibility and fiber digestion was recorded by the addition of probiotics, including aspergillus fermentation extracts *(20)*, yeast cultures *(21)* and *Saccharomyces cerevisiae (22)*, by improving the ruminal fermentation and increasing the number of rumen protozoa, resulting in excessive weight gain (table 3). It appears that the stimulation of fiber degradation, in the rumen of the calves caused by probiotics (such as yeast), can not be explained by a simple increase in the rumen pH, rather that the effect is modulated via an increase in the number and activity of cellulolytic bacteria *(23, 24)*, In addition to that , the benifical effect of probiotics is attributed to more production of digestive enzymes and B vitamins that increase the digestibility of nutrients *(25)* .Table (3) shows the improvement of food conversion and the increase of the body weight gain in probiotic additive groups than the control non additive groups.

The microbial digestion and fermentation of the ingesta are the main function of the rumen so that the examination of the rumen juice was used as an indicator for ruminal activity.

Table 3 shows a non significant difference between the control and the supplemented groups during the same season regarding color, odor, consistency as well as indol test and hydrogen sulphide test. All the samples were slimy to viscous in consistency, with aromatic odor, positive for indol test and strongly positive for $H_2$ S test. The color varied from olive green to greenish yellow during green season and yellowish white during the dry season. These findings are in agreement with those reported previously during the feeding of dry *(1)* and green *(26)* rations for healthy control sheep.

The sedimentation activity test has been introduced to assess the activity of the ruminal microflora. The recorded values in the control groups ( table 3 ) were supported by **El-Sebaie** *(27)*: 20-35 minutes and **El-Hady** *(26)*: 26 – 32 minutes in healthy control sheep.

The rumen protozoa play a significant role in nutrients metabolism and performance of the ruminant host animal. The protozoa can occupy a substantial portion of the rumen microbial biomass (up to 50 % ) and

only 5-20 % of the protozoal population may be present in the fluid portion of rumen digesta after feeding of sheep *(28).*

Tables 4,5 show that the protozoal motility was highly active and the protozoal number varied from 5.5 to $7.25x10^5$ in the rumen juice obtained from healthy control lambs.

The protozoal numbers were significantly increased after the supplement and ranged from5.5 to 7.25 x $10^5$ (tables 4,5). Similar improvement was previously recorded in the ruminal juice of young bulls after the supplement of yeast preparation (29 )and after the effect of saccharomyces (23) and yeast culture *(24)* for stimulation of rumen fermentation..

Table 4 shows that the supplement of the dry and green rations with Protexin and Biomix increased the rumen juice contents of TVFA and ammonia, whereas the pH was less than that of the control non supplemented groups.

The variation in the TVFA concentration, due to the supplement was highly significant indicating diurnal variant in the production. The peak concentration (98.75) was observed by supplementing of Protoxin during feeding the green ration after the seventh week. It may be due to ample availability of nutrition and maximum fermentation activity by this product. This finding is supported by the significant increase of the microflora counts with a significant decrease of pH in the rumen juice samples which was obtained from the supplemented lambs (tables 4 and 5). Similar significant increases of the TVFA were previously recorded *(30)* after using Aspergillus oryzae fermentation extract, and after using the probiotic Ilaidlomycin *(16, 31).* Lowering the pH was also recorded *(19)* due to the effect of two probiotics (Saccharamyces or Aspergillus) on the rumen juice of sheep. It was attributed to the production of acetic, lactic and volatile fatty acids.

The increase of ammonia concentration, in the rumen juice of the supplemented groups, may be attributed to an increase of the proteolytic activity; however, these probiotics may posses a protein sparing effect. Similar effect was previously recorded in the mixed ruminal microorganisms in vitro with using Aspergillus oryzae fermentation extract (30) and in ruminal juice obtained from healthy lambs supplied with lasolacid *(32)* .

It could be concluded that the addition of probiotic (Protexin or Biomix) has a beneficial effect on the body performance, feed conversion and ruminal juice contents.

**Table1:** Composition of the experimental diet on dry matter basis

| Ingredient | Composition | |
|---|---|---|
| | Dry season | Green season |
| **Physical composition (%)** | | |
| Concentrate mixture* | 60 | 60 |
| Berseem hay(15.8% CP) | 40 | - |
| Green berseem | - | 40 |
| **Chemical composition** | | |
| Crude protein% | 14.72 | 14.8 |
| Digestible energy Mcal/Kg | 3.15 | 3.17 |
| Ca% | 0.96 | 1.12 |
| P% | 0.62 | 0.65 |

*Produced by El-Marg Factory containing 14% CP & consisting of (26% ground yellow corn, 42% wheat bran, 20%cotton seed cake, 2% ground limestone, 1%common salt & 9%molasses)

**Table 2:** Body weight development and feed conversion of lambs fed on dry or green ration and supplemented with Probiotic

| Criterion | | Dry season | | | Green season | | |
|---|---|---|---|---|---|---|---|
| | | Control | Protexin | Biomix | Control | Protexin | Biomix |
| Initial body weight(Kg) | | 30 | 28 | 30.7 | 28.75 | 27 | 28.3 |
| Final body weight(Kg) | | 34 | 33 | 36.8 | 32.75 | 34.37 | 33.75 |
| Weight gain(Kg) | | 4 | 5 | 6.1 | 4 | 7.37 | 5.45 |
| Average daily gain(g) | | 82 | 102 | 125 | 82 | 150 | 111 |
| %of Weight gain | | 13.33 | 17.86 | 19.87 | 13.91 | 27.3 | 19.26 |
| Feed DM intake(Kg) | concentrate | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 | 35.8 |
| | roughage | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| Feed conversion | | 14.8 | 11.86 | 9.72 | 14.8 | 8.05 | 10.88 |

**Table 3:** Characteristics of rumen juice of lambs during the dry and green seasons with or without probiotic supplement

| Criterion | Dry season | | | Green season | | |
|---|---|---|---|---|---|---|
| | Control | Protexin | Biomix | Control | Protexin | Biomix |
| Color | Dark - green | Dark - green | Dark- green | Olive - green to grey green | Olive - green to grey -green | Olive - green to grey -green |
| Odor | Aromatic | Aromatic | Aromatic | Aromatic | Aromatic | Aromatic |
| Consistency | Slimy | Slimy | slimy | slimy | Slimy | slimy |
| SAT | 30-35(32.5) | 30-35(32.5) | 30-35(32.5) | 32-40(36) | 32-40(36) | 32-40(36) |
| Protozoal | +++ | +++ | +++ | +++ | +++ | +++ |
| Indol test | ++ | ++ | ++ | + | + | + |
| Hydrogen sulphide test | Strong + | Strong + | Strong + | Strong + | Strong + | Strong + |

+++, Highly active, motile, crowded

**Table 4:**Rumen juice contents of lambs during green season on rations with or without supplement .

| Criterion | TVFA | pH | Ammonia | Microflora |
|---|---|---|---|---|
| **At the first week:** | | | | |
| Control | 51.5±1.56 | 6.81±0.01 | 14.7±1.34 | $5.5\times10^5$±0.20 |
| With Protexin | 51.5±1.71 | 6.80±0.02 | 14.7±1.34 | $5.5\times10^5$±0.34 |
| With Biomix | 50.0±1.56 | 6.788±0.02 | 13.72±0.76 | $6.10\times10^5$±0.25 |
| **At the fourth week:** | | | | |
| Control | 56.25±1.75 | 6.793±0.011 | 14.7±1.34 | $6.5\times10^5$±0.25 |
| With Protexin | 78.75±0.75 | 6.515±0.016 | 23.8±1.807 | $8.5\times10^5$±0.38 |
| With Biomix | 72.20±1.06 | 6.531±0.02 | 24±0.97 | $9.10\times10^5$±0.22 |
| **At the seventh week:** | | | | |
| Control | 63.25±1.38 | 6.74±0.02 | 17.5± 1.34 | $7.25\times10^5$±0.32 |
| With Protexin | 98.75±0.996 | 6.32±0.016 | 31.5±1.34 | $14.25\times10^5$±1.27 |
| With Biomix | 89.70±1.31 | 6.311±0.01 | 31.36±1.05 | $16.75\times10^5$±0.15 |

**Table 5:** Rumen juice contents of lambs during the dry season on rations with or without supplement .

| Criterion | TVFA | pH | Ammonia | Microflora |
|---|---|---|---|---|
| **At the first week:** | | | | |
| Control | 55.5±2.102 | 6.83±0.04 | 12.6 0.8 | $5.87\times10^5\pm0.31$ |
| With Protexin | 54.5±3.33 | 6.87±0.02 | 14.7 ±1.34 | $5.88\times10^5\pm0.43$ |
| With Biomix | 50±1.56 | 6.79±0.02 | 13.72±0.76 | $6.100\times10^5\pm0.25$ |
| **At the fourth week:** | | | | |
| Control | 57.75±3.75 | 6.77±0.03 | 16.10±1.34 | $6.47\times10^5\pm0.41$ |
| With Protexin | 70.25±1.548 | 6.62±0.012 | 23.80±0.808 | $8.87\times10^5\pm0.25$ |
| With Biomix | 72.2±1.06 | 6.531±0.02 | 24.08±0.97 | $8.88\times10^5\pm0.4$ |
| **At the seventh week:** | | | | |
| Control | 65.25±3.18 | 6.79± 0.06 | 22.4± 1.62 | $8.37\times10^5\pm0.22$ |
| With Protexin | 86.25±4.31 | 6.37±0.09 | 31.5± 1.34 | $18.5\times10^5\pm0.45$ |
| With Biomix | 89.7±1.31 | 6.311±0.01 | 31.36±1.05 | $16.75\times10^5\pm0.15$ |

## REFERENCES

*1-Ibrahim MA (1993):* Role of ruminal juice in treatment of ruminal disturbances in sheep.M.V.Sc. Thesis, Fac. of Vet. Med., Zag. Univ.

*2-Fuller R (2003):* Probiotics in the Animal kingdom. Foods pty. Ltd 2003. 1 st ed.

*3-Gilliland S (2004):* Probiotics provide benefits for livestock. Oklahoma State University, Division of Agricultural Sciences Natural Resources. Seg @ ok state. Edu.

*4-NRC (1985) :* Nutrient requirements of sheep. 6th Ed. National Academy of Science. Washington, D.C.

*5-Conway EJ (1957):* Microdiffusion analysis and volumetric errors. 2nd Ed. London Crosby-Lockwood and Sc. Ltd.

*6-Rosenberger G (1979):* Clinical examination of cattle.Verlag Poul Parey, Perlin and Hamburg, Transulation of 2nd edition.

*7-Wolf M L (1964):*Untersuchungen uber die brauchbakeit des pansen softer fur diagnostiche und therapeutische zwecke bei aufbewahrung unter verschiedenen temperaturen. Disseration, Hannover.

*8-Hackel W (1952):* Cited by, El-Hady KM (2003)

*9-Warner A C (1964):* Production of volatile fatty acids in the rumen. 1-Methods of measurements. Nut. Abst. And Rev. 34:339

*10-MSTAT-CV.2.10 (1988):* A microcomputer program for the design, monagement and analysis of agronomic Res.. Exp, Michigan State Univer., USA

*11-Ricke SC ; Berger LL ;Vander Art PJ and Fahey JrGC (1984):* Effects of lasolacid and monensin on nutrient digestion, metabolism and rumen characteristics of sheep. J. Anim. Sci. 58: 194.

*12-Warner G and Douglas B (1984):* Ionophores:their effect on production efficiency and mode of action.J. Anim.Sci. 58: 1465.

*13-Sissons J W (1989):* Potential of probiotic organisms to prevent diarrhea & promote digestion in farm animals, a review. J. Sci. Food Agric. 49:1.

*14-Fuller R (1990):* Pobiotics in agriculture. Ag. Biotech News & Info. 2(2) : 217.

***15-Williams PEV, Tait CAG, Innes GM and Newbold CJ (1991):*** Effects of the inclusion of yeast culture (Saccharomyces cerevisiae plus growth medium) in the diet of dairy cows on milk yield and forage degradation and fermentation patterns in the rumen of sheep and steers. J. Anim. Sci., 69, 3016- 3026.

***16-Wallace RJ and Newbold CJ(1992):*** Probiotics for Ruminants. In Probiotics: The Scientific Basis, ed R. Fuller, Chapman and Hall, London, pp 317-353.

***17-Erasmus LJ, Botha PM and Kistner A (1992):*** Effect of yeast culture supplementation on production, rumen fermentation, and duodenal nitrogen flow in dairy cows. J.Dairy Sci., 75, 3056-3065.

***18-Jouany, J.P., Mathieu, F., Senaud, J., Bohatier J, Bertin G and Mercier M (1998):*** Effect of Saccharomyces cerevisiae and Aspergillus oryzae on the digestion of nitrogen in the rumen of defaunated and refaunated sheep. Anim. Feed Sci. Tech., 75, 1-13.

***19-Jouany J, Mathieu F, Senaud J, Bohater J, Bert in G and Mercier N (1999):*** Effect of Saccharomyces cerevisiae & Aspergillus orzae on the digestion of nitrogen in the rumen of defaunated & refaunated sheep. Nutr. Abst. & Rev., Servies B, 69,2:116

***20-Chang J S, Harper EM and Calza RE (1999) :*** Fermentation extracts effects on the morphology and metabolism of the rumen fungus *Neocallimastix frontalis* EB188. J. Appl. Microbial. 86:389-398.

**21-Chaucheryras, F, Fonty G, Bertin G, and Gouet P (1995) :** In vitro utilization by a ruminal acetogenic bacterium cultivated alone or in association with an Archea methanogen is stimulated by a probiotic strain of *Saccharomyces cerevisiae*. Appl. Environ. Micro. 61:3466-3467.

**22-Plata F P, Mendoza GD, Barcena-Gama JR and Gonzalez SM (1994) :** Effect of a yeast culture (*Saccharomyces cerevisiae*) on neutral detergent fiber digestion in steers fed oat straw based diets. Anim. Feed Sci. Tech. 49:203-210.

***23-Callaway ES and Martin SA (1997):*** Effects of a Saccharomyces cerevisiae culture on ruminal bacteria that utilize lactate and digest cellulose. J. Dairy Sci., 80, 2035-2044.

***24-Koul V, Kumar U, Sareen VK andSingh S (1998):*** Mode of action of yeast culture .(Yea-Sacc 1026) for stimulation of rumen fermentation in buffalo calves. J. Sci.Food Agric.. 77, 407-413.

***25-Steffanus D (1997):*** Facts about the probiotic fad. Equine Athlete (1997) 10 (2) 28-29 .

***26-El-Hady KM(2003):*** Studies on some ruminal & blood changes during &after administration of some therapeutics in sheep. M.V.Sc , Zag.Univ.

***27-El-Sebaie A (1974):*** Some studies on indigestion in sheep. M.V.Sc. Thesis, Fac. of Vet. Med. Assiut University.

***28-Smith M C and Oldham A (1983):*** Cited by Dirksen G. & smith MC(1987):Acquistition and analysis of bovine rumen fluid. Bovine Practitioner, 22:108-116

***29-Strzetelski J; Maciegewicz-Ryś J; Bilik K ; Stasiniewisz T ; Lipiarska E and Stecka K(1997):*** Effect of new yeast preparations on calf rearing , rumen fermentation and protozoa population in the rumen of young bulls. Nutrition abstracts & reviews (series B) 1997 Vol. 67 No. 8

***30-Martin SA and Nisbet Dj (1990) :*** Effects of Aspergillus oryzae fermentation extract on fermentation of amino acids, bermudagrass and starch by mixed ruminal microorganisms in vitro. J. of Anim. Sci (1990) 68 (7) 2142-2149

***31-Domescik E and Martin S (1999):*** Effects of Laidlomycin propionate & Monensin on the in vitro mixed ruminal microorganism fermentation . J. Anim. Sc. , 77: 2305-2312.

***32-Hegazy M and Elias A (1997):*** Influence of dietary monensin & lasalocid on age & weight of Barki Ram & ewe lambs at puberty. Assiut V M J, 37, 74

## الملخص العربى

# تأثير إضافة البروتكسين والبيومكس على كفاءة النمو ومكونات عصارة الكرش في الحملان أثناء تغذيتها على عليقة خضراء وأخرى جافة

**هيام محمود سامي*، عبد الخالق الشيخ****

* قسم التغذية والتغذية الأكلينيكية- كلية الطب البيطرى-جامعة قناه السويس
**قسم طب الحيوان - كلية الطب البيطرى- جامعة الزقازيق

أجريت هذه التجربه على عدد ٢٤من الحملان البلدي تتراوح أعمارهم من٦ إلى ٧ شهور، استخدم منهم ١٢ في موسم الشتاء وقسمت إلي ثلاث مجاميع متساويه المجموعة الأولي استخدمت كمجموعة ضابطه أما الثانيه والثالثة تم إمدادها بالبروتكسين والبيومكس على التوالي، وعدد ١٢ من الحملان الأخرى استخدمت في موسم الصيف وقسمت إلي ٣ مجاميع متساوية ، المجموعه الرابعة كمجموعه ضابطه ، أما المجموعة الخامسة والسادسة تم إمدادها بالبروتكسين والبيومكس .

المجموعة الضابطة غذيت علي عليقه أساسيه بدون إضافة أما باقي المجاميع غذيت علي نفس العليقه ولكن أضيف إليها البيوبيوتك (بروتكسين أو بيومكس) حيث تم اضافة ٥ جرام من البروتكسين لكل حيوان او اضافة نصف جرام من البيومكس لكل كيلو جرام من المركزات و استمرت التجربتين لمدة سبعة اسابيع .

في التجربتين كان متوسط الزيادة في وزن الجسم اليومي والنسبة المائوية للزيادة في وزن الجسم أعلي مع تحسن في التحويل الغذائي عن المجموعة الضابطة ، وأحسن نتائج كانت مع البيومكس أثناء موسم الصيف (العليقة الجافة) ومع البروتكسين في موسم الشتاء(العليقة الخضراء) ، ووجد أن النوعين من البروبيوتك ليس لهم تأثير علي عصارة الكرش من ناحية اللون والرائحة وتجربة الإندول وتجربة كبريتات الهيدروجين ، ولكن لهم تأثير معنوي علي عدد ومجموعات الميكروفلورا والأحماض الدهنيه المتطايرة وتركيز الأمونيا عند الأسبوع الرابع والسابع أثناء الموسم الأخضر والموسم الجاف في المجموعات التي تم إمدادها بالبروتكسين وسجل أعلي عدد للميكروفلورا مع البروتكسين أثناء الموسم الجاف وأعلي كميه للأحماض الدهنيه المتطايرة مع البروتكسين أيضا ولكن في الموسم الأخضر بينما الأس الهيدروجيني أظهر نقصا معنويا في الأسبوع الرابع والسابع مع النوعين من البروبيوتك في الموسم الجاف والأخضر .

ومن هذا نستخلص أن إضافة البروبيوتك (البروتكسين والبيومكس) له تأثير مفيد علي كفاءة الجسم والتحويل الغذائي وعصارة الكرش.