

## RESEARCH STUDY ON POSSIBILITIES TO INCREASE MONGOLIAN MUTTON INDUSTRY

**Baatartuya D\*, Batsukh T., Oyuntungalag Z., Lugtegsuren A., Badamdorj D.**

Research Institute of Animal Husbandry, MULS, Mongolia

\*Email: d\_btuya@yahoo.com

### ABSTRACT

*According to current tendencies of world sheep industry development and suiting to government strategy to intensifying animal husbandry and production especially in meat industry, we have developed a strain using the Barga meat and fat breed ram onto local Mongolian breed sheep by outbreeding method which increased meat yield and tail fat accumulation.*

*The National Institute of Animal Husbandry has conducted research studies from 2011 to 2015 in Arvaikheer, Baruunbayan-Ulaan, Bat-Ulzii, Bayan-Undur, Bayangol, Bogd, Guchin-Us, Yusunzuil, Zuunbayan-Ulaan, Nariinteel, Ulziit, Sant, Taragt, Tugrug, Uyanga, Khairkhan-Dulaan, Kharkhorin and Khujirt soums of Uvurkhangai aimag aiming at documenting growth and development of offspring from outbreeding Barga ram and local Mongolian breed sheep, for 4.5 years of duration by commonly used methods which expresses comparative results of live body weight by kilogram and determined the overall and relative growth.*

*In pasture grazing condition, birth weights of lambs were  $3.76\pm 0.25$ - $3.85\pm 0.12$  kg and at 8 months of age  $36.46\pm 0.37$ kg which shows rapid growth with daily addition of 140 grams of weight. In the following months, due to poor nutrition and pasture for ewes, milk yield decreases drastically which directly affects lambs along with inadequate food supplement given which slowed intensity of growth, however during summer and autumn season, lambs gained weight and at 18 months of age, body weight were  $53.6\pm 0.35$ kg which is 8.5-8.7 times higher than those of new born weight.*

**Key words:** sustainability, body weight, pasture.

### INTRODUCTION

Livestock industry serves as bases of development of economy of Mongolia as ecologically pure food manufacturing and supplying animal derived raw materials to industries and in which sheep occupies 44.5% of total livestock population with a great role. The world tendencies to increase meat production is directed to growing dual purpose breeds such as meat and milk cattle, meat and wool livestock breeds

and pork and broiler industry. According to this approach, the government of Mongolia is holding a policy to develop and promote meat production industry, thus we have created a selectively improved suitable strain using meat and fat Barga breed ram onto local Mongolian breed sheep by an outbreeding method. Features of this suitable strain are more resistant to ecological and climate

harshness of central region of Mongolia and highly adaptable to pasture grazing, strong and burly, with greater meat yield, quick fattening ability, better pasture utilization and high competitive in market value.

Studying principle of physiological growth and development of animal was always a fascinating matter for a researchers in the field of biology.

In the concept of development, quantitative and qualitative notions deepens into details and for an example, differentiation in the organs are considered and growth as a quantitative definition.

Due to genetic features of an animal, nutrition or food supply and seasonal changes, animal's whole body or part of it getting bigger or shrinking (gaining or losing weight) changes are observed and this process itself is one of the stages of development.

Thus the growth and development are deeply correlated, complex concept which cannot be understood separately and changes in quantity or in quality are coherently processed actions.

Various scientists explain growth and development of animal body differently. Shmalgausen I. I. /1/ states that not the whole body, but a part of it gets bigger based on the increase of free energy and Svechkin K. B. /2/ tells that quantitative changes occur during renewing process and regeneration thus the increase of organ and tissue's weight, dimension and volume occurs. Following researchers Hemmond J. /3/, Kolesnik N. N., Federov V. I. /4/, Gazyarin N. G., Belousov L. V. /5/, Novikov B. A. /6/ are view that increase in body weight and dimension of an animal and changes in ratio and shape of the body are considered growth.

Mongolian scientists Ayurzana P. /7/, Ayush B. /8/, Tumurjav M. /9/, Chadraabal G. /10/, Minjigdorj B. /11/, Nyamaa Ya. /12/, Batsukh G. /13/, Arvii Ts. /14/, Purev. B., Sukhee H. /15/, Sambuu G. /16/, Gonchigjav Z. /17/, Nyamdovchin P. /18/, Sanjmyatav Kh. /19/, Khatran O. /20/ are defined that growth in livestock especially in sheep are changes of live body weight, increased size of body parts, organs and tissue.

## MATERIALS AND METHODS

Outbred lambs and local Mongolian breed ewes kept at the Experimental and research centre of National Institute of Animal Husbandry in Uvurkhangai aimag were selected as a research object and their growth and development were recorded by commonly used methods /weighting and measuring/ regularly from new born till 4.5 years of age.

Live body weight and body part measurements were recorded and absolute weight was calculated by the formula is listed as below:

$$A = \frac{w_1 - w_0}{t}$$

Relative body weight was calculated by the following formula.

$$A = \frac{w_1 - w_0}{w_0} * 100\%$$

Growth were measured by above formulas and were compared with other breed sheep measurements. Numeric values were processed by accounting methods.

## RESULTS

Changes in body weight of an animal is one of the measurements for the determination of growth and development.

Birth weight of a lamb indicates foetal development and growth in the womb of ewe and it directly affects the following stages of growth activity.

By our study, new born crossbred lambs body weight of crossbred lamb were 210 to 340g higher than those of local Mongolian breed lamb which both born in typical pasture condition.

Table 1

Comparative research on growth of local Mongolian breed sheep and first stage outbred crossbreed of Barga and Mongolian breed

№	Breed	Gender	n	Biological age			
				Birth	VIII month	XIV month	XVIII month
				Calendar time			
				III	XI	V	IX
1	Barga breed and local Mongolian	Male	30	3.85±0.12	37.45±0.28	31.0±0.31	53.6±0.35
2	breed sheep's crossbreed F1	Female	30	3.76±0.25	35.47±0.45	29.9±0.27	50.28±0.29
3	Local Mongolian	Male	20	3.64±0.36	35.85±0.26	29.05±0.34	45.7±0.35
4	breed	Female	20	3.42±0.29	34.24±0.54	27.74±0.28	41.8±0.42

Body weight growth of lambs were high in the first few months after the birth which indicates the strength and fat accumulation of ewe were quite good. Crossbreed new born lamb's body weight

were 0.34- 0.21kg higher than those of local Mongolian breed and this feature intensifies in the following months and by 8 months of age, lambs reach to 37.45kg of live body weight.

Table 2

Research of relative and absolute growth of F<sub>1</sub> crossbreed of Barga and Mongolian breed and local Mongolian breed sheep

Breed	Age (by month)	n	Live body weight, kg	Absolute growth		Relative growth (by percent)
				Gained weight, kg	Daily gain of weight, kg	
Barga breed and local Mongolian breed sheep's crossbreed F <sub>1</sub>	Birth weight	30	3.81±0.19	=	=	=
	VIII months	30	36.46±0.37	32.65	0.14	8.56
	XIV months	30	30.45±0.29	-6.01	-0.036	-0.17
	XVIII months	30	51.94±0.32	21.49	0.125	0.72
Local Mongolian breed	Birth weight	20	3.53±0.33	=	=	=
	VIII months	20	35.05±0.33	31.97	0.14	8.93
	XIV months	20	28.40±0.31	-7.01	0.04	-0.19
	XVIII months	20	43.75±0.39	15.71	0.13	0.53

Determining absolute daily weight gain and absolute monthly weight gain are essential to displaying growth and development of livestock.

By our research result, absolute growth of lambs at 8 months of age was 32.65kg which means daily weight gain was 140g and relative growth was very intensive with 8.72%. At 14 months of age, daily weight gain became -36gr but relative growth decreased by 0.17%. This happened during the April to May which clearly shows the pasture pool has drastically fallen time and along with this, nursing ewe's milk will decrease substantially and food supplements given to lambs were not adequate. Thus, introducing solid fodder supplement to lambs and supplying high quality nutrition additives until fresh green grass pasture stabilizes and furthermore feeding of nursing ewe are necessary.

However after weaning lambs, the weight gain has decreased, probably due to unstable and vulnerable behavioural condition of lamb and shortened grazing time, pasture grass wilting and decreased quality of pasture greens.

Growth and development of livestock solely dependent on pasture grazing is related to various factors such as ecological and climate condition, nutrition and pasture, thus the growth is dependently activates (summer and autumn) and slows (winter and spring) regularly with intervals throughout the years and physiology reaches to adulthood without regaining the sustainable body weight.

We can assume that Mongolian breed sheep grows actively until 18 months of age and according to the principle of pasture grazing livestock, lose body

weight during winter and spring time and gain back the weight during summer and autumn seasons and after 3 to 4 times of such cycle, reach to the

adulthood sustainable body weight at 3.5 to 4 years of age.

## DISCUSSION

Following researchers Ayurzana.T. /1959/, Ayush.B. /1957/, Dashiiv.N. /1991/, Chadraabal.G. /1986/, Lhagvasuren.D. /2003/, Batsukh.G. /1972/, Lugtegsuren.A. /2000/ wrote that fine and semi-coarse wool sheep new born lambs weight were 3.5-3.8kg and by the 7 to 8 months of age, body weight reaches to 32.9-35.4kg. Arvii.Ts. /1960/, Purev.B. /1970/, Sukhee.N. /1999/, Arildii.Ch. /2014/, Sonompil.T. /1978/, Sambuu.G. /1994/ recorded that coarse and semi-coarse breed new born lambs weight 3.5-4.05kg and at 7 to 8 months of age, reaches to 32.3-35.4kg. Gonchigjav.Z. /1961/,

Nyamaa.Ya. /1994/, Minjigdorj.B. /1996/, Nyamdovchin.P. /1993/, Khatran.O. /1994/, Sanjmyatav.Kh. /1994/. Stated that, the new born lambs average weights of coarse wool breed sheep is 3.62 to 3.9 kg and at 7 to 8 months of age, the weights reaches to 33.5 to 35.8 kg with great intensity. By the research conducted by our team, the new born lambs weights of crossbreed is  $3.81 \pm 0.19$ kg and at the 8 months of age, it weights  $36.46 \pm 0.37$ kg and increases its body weight by 8.56 %.

## SUMMARY

1. Intensifying growth and development of sheep by using dominant features of live weight /heterosis/ and growth, development process of cross breeds resulted increase of live weight by 8 to 10 percent, slaughtering weight by 9.5 to 25.5 percent which presents possibilities to decrease the price of mutton by 10 to 20 percent is proved by experiments and implemented production work results.
2. Growth and development of Mongolian sheep slows and lose weight during winter and spring seasons and gain back the weight actively during summer and autumn seasons with 3 to 4 repeated dynamics and by the 3.4 to 4.0 years of age, sheep reaches to adulthood which remains its regular weight.

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