LAMB FATTENING IS A MODEL TO REDUCE LAND DEGRADATION AND GHG, BOOST MEAT PRODUCTION AND HERDERS' INCOME

Article published on UB Post, English language newspaper, 7 November 2022

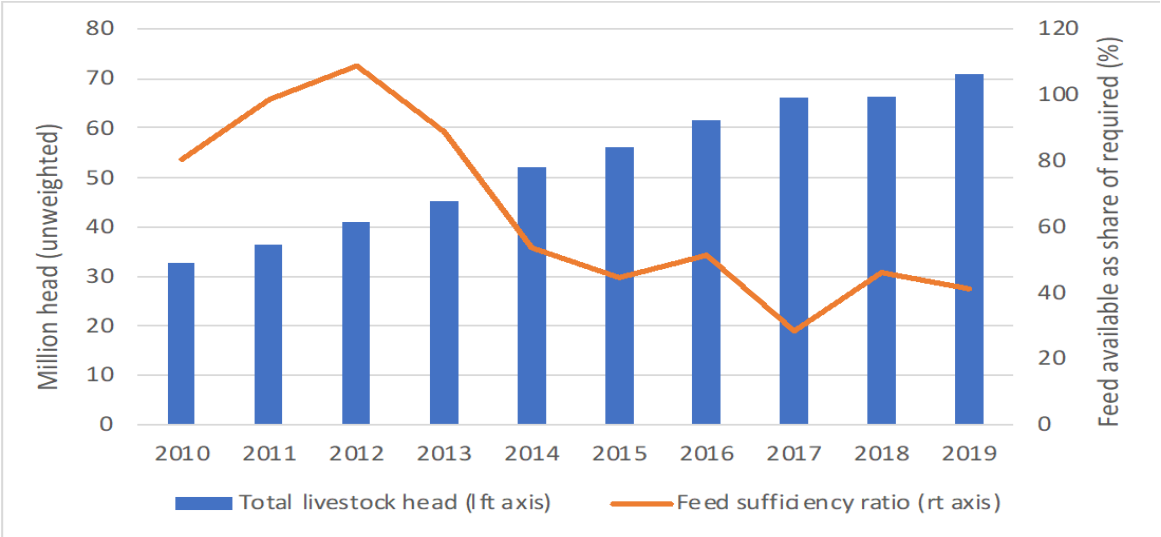
The "Vision - 2050" long-term policy document has set target to improve the resource utilization and commercialization of agricultural production and transforming the sector from quantity to productivity and quality.

For this, there is a need to adjust the number of livestock to the capacity of pastures and to switch to production based on productivity and quality, which produces high-quality products with added value.

1. Pasture overgrazing and its negative consequences

The sharp increase in the number of livestock is the main reason for overgrazing. Livestock numbers have doubled in less than 10 years. Due to pasture degradation, livestock feed supplies have fallen significantly below nutritional requirements (**Figure 1**).

Figure 1 Herd size growth and feed sufficiency rate, 2010-2019

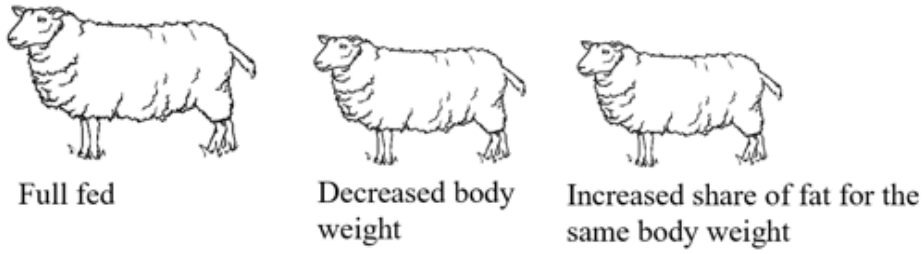


Source: NSO for livestock numbers, CPR estimates for feed sufficiency ratio estimated using pasture grass yield data by NAMEM

- As of 2021, as the number of animals has increased to 67 million, the feed supply rate has declined to 41% meaning 2.2 sheep is sharing pastures sufficient for 1 sheep
- It is not a wise policy, but the *dzud* is "regulating" the stocking density and mitigating the chronic shortage of feed. Immediately after the 2009-2010 *dzud,* the feed was sufficient for the 35 m livestock. However, by 2019, the total available feed had declined to 41% of requirements
- As a result of chronic feed sufficiency, livestock productivity is decreasing:
  - In 2004-2014, the live weight of sheep decreased by 1-2 kg and that of cattle by 30 kg
  - In 1990-2016, the weight of pig carcasses decreased by 13.9%

- Livestock emits 48.5% of the country's greenhouse gases (GHG) and has become the second largest ‘polluter’ after the energy sector
- The incidence of transboundary diseases does not decrease curbing meat exports
- Carcass quality deteriorates due to overgrazing, fat percentage increases, and meat percentage decreases, resulting in lower value in the export market. Thus, 14% loss in live weight and 33% loss of carcass quality result in a 42% loss of the livestock value compared to animals with full supply of pasture feed, as shown below.

Figure 2 Declining livestock productivity and meat quality due to severe overgrazing and chronic feed deficiency



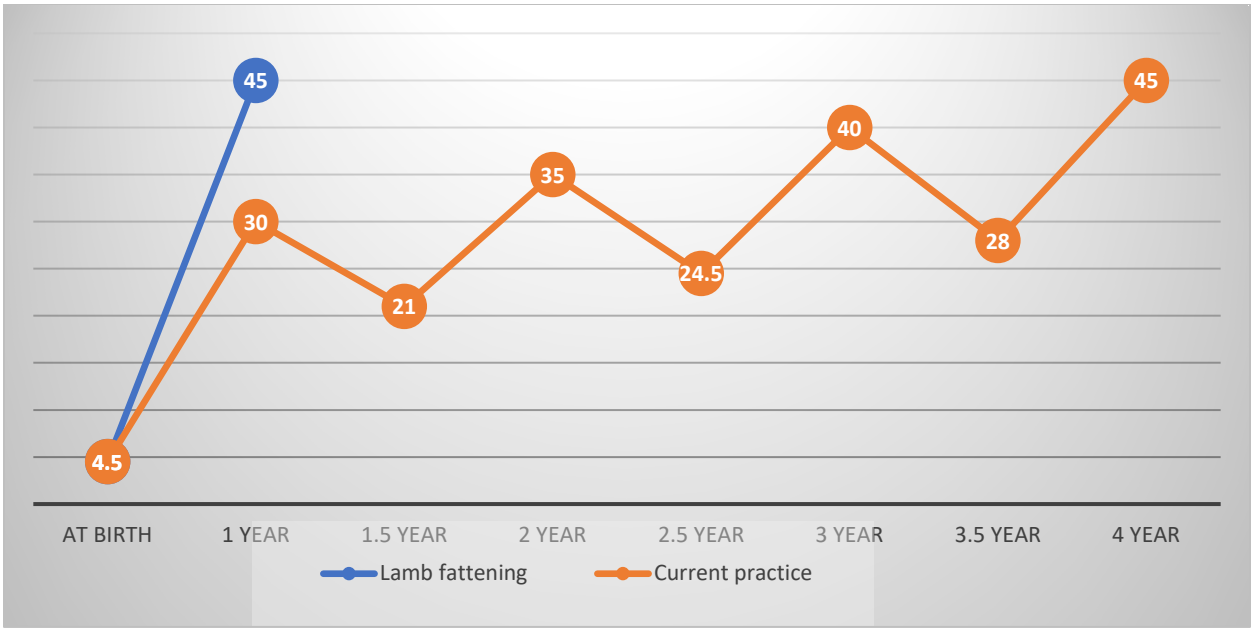
2. **Lamb fattening as a solution to overgrazing by increased livestock sales/commercialization**

The real reason for the increasing herd size is related to the decreased livestock productivity due to chronic feed deficiency which results in a long delay preventing animals to reach the slaughter weight at earlier ages. For example, due to low body weight the sales of 2 and 3year old sheep have drastically decreased and most sheep reach the slaughter weight at the age of three and four. Traditionally, Mongolian lambs reach their peak weight of around 37 kg in October-November of the calendar year, but lose more than 20% of this weight in the winter-spring period, gain weight starting from April-May of the following spring, and go on sale in from July-August. However, because of overgrazing and undernutrition in recent years, the live weight of the lambs does not reach 30 kg, so there is no sale of the lambs and even two-year-old sheep.

The shortest way to reduce the herd size without reducing the herders’ income is to organize lambing early and ensure sufficient milk for the lambs by feeding the ewes. In this way, there will be no need to keep sheep on pastures for 3-4 years /**Figure 3** .

Estimates for the lamb sales were made in 4 versions based on the sheep herd turnover. The versions include: A- the practice of recent years to increase the herd size by an average of 10% per year, B-D -3 options with the steady herd size (no herd size growth) and different shares of ewes and lamb sales.

Figure 3 Sheep live weight by years, kg



3. Lamb fattening as a model for boosting meat production

The extent of lamb selling is directly related to the percentage of ewes in the herd, so if only 6% of male lambs and 3% of female lambs can be sold under the current practices where the percentage of ewes is around 45% The meat production increases dramatically with increased percentages of ewes /**Table 1**/.

Table 1 How lamb sales increase meat production, herders' income and reduce pasture demand, per 100 sheep

Options	Share of ewes, %	Lamb off-take rate M-male lamb F-female lamb	Meat production, kg	Required pasture forage			Meat income MNT m	Income growth	
				Total, centner	Pasture area, ha	Pasture area required for producing 100 kg of meat, ha		%	MNT m
A	45%	No lamb sales	526	607	289	55	3.58	-	-
B	45%	M 6%, F 3%	709	584	278	39	4.82	34.7%	1.24
C	60%	M 72%, F 5%	884	602	287	32	6.01	68.0%	2.43
D	70%	M 95%, F 16%	1001	614	293	29	6.81	90.3%	3.23

Note: meat price of MNT 6800 is the national average of 2019-2021, pasture grass yield of 210 kg/ha is the national average of 2016-2020, average live weight of lamb is 42.5 kg (50% of lambs reach 45 kg, 50%-40 kg), carcass to live weight ratio 43%.

Shifting from A to D increases livestock and land productivity as well as income, with less pastures required. For example, 100 kg of meat is produced in 29 hectares of pasture under D, which is 26 hectares less than the option A of 55 hectares, or 47% reduction in the pasture demand.

Most importantly the herders' income from meat production increases by MNT 1.2-3.2 m per 100 sheep compared to the current practice.

526 kg of meat produced from 100 sheep under the current practice, is produced from 52 sheep by selling lambs, which means that the meat production can be maintained at the current level if the number of sheep is reduced by 48%. This gives the opportunity to reduce the 31.1 million sheep counted in 2021 to 16.2 million while keeping the current level of meat production. In this way, the total number of all animals can be reduced from the current 115.3 million to 100.4 million sheep units or by 13.4%, and overgrazing, feed deficiency and livestock greenhouse gases will be reduced to the same extent.

4. Lamb fattening as a model for boosting herders' income from fewer livestock

The evidence shows that the increased herd size has not improved the livelihood of herders. According to the World Bank, between 2014 and 2016, poverty increased by 8 percentage points from 27.1 percent to 34.9 percent, and rural poverty has always been higher than urban poverty.

The reason is clear that steady declines in land and livestock productivity and product quality overrides any benefits from the increased herd size. In addition, due to lack of nutrition, animals become more vulnerable to natural risks and diseases such as dzud, drought, and climate change. In other words, herders' behavior traps them in a vicious circle in which they strive hard to maximize animal numbers after a *dzud* but end up with decreasing returns per animal as their strategy destroys pastures, decreases livestock productivity, and swallows up emergency *otor* reserve pastures making losses for the next *dzud* even more devastating.

By selling lambs, it becomes possible to protect the pastures that are the basis of the livestock herding and to improve the livelihood of herders in the long term. This can be seen from the simple financial analysis of the pilot results undertaken in the Bayantsagaan soum of Bayankhongor aimag and the Ulziit soum of the Arkhangai aimag under the UNDP ENSURE project in 2021-2022.

In order to bring lambs to 45 kg of live weight in autumn:

- Use superior local breeds of rams
- Provide supplementary feed to ewes with male lambs with 250 grams of high-quality concentrates per day for 45 days to improve feed supply as well as its efficiency for both mothers and lambs by reducing the distance ewes and accompanying lambs walk on poor pastures to graze losing the scarce energy
- At the end of July, separate the lambs from their mothers and organize separate grazing on good pastures
- The cost of supplementary feed is MNT 1.1 m for 100 sheep, MNT 0.3 m for lamb herding fee, MNT 0.9 million for buying three superior rams, the total cost is MNT 2.3 million

By selling fattened lambs, the additional income from meat production reached MNT 3.23 m under the option D with ewes share of 70%. The total cost of MNT 2.3 m deducted from the above income, the net income constitutes MNT 0.9 m. This estimate is shown below in case of a herder household with 500 sheep.

Table 2 Comparative estimate of meat income, 500 sheep

Indicators	Current practice	Lamb fattening, 70% share of ewes
Sheep number, heads	500	500
Production of meat, tons	2.63	5.0
Price of 1 kg of meat, MNT	6800	6800
Total meat income, m MNT	17.9	34.0
Cost of fattening lambs, m MNT	-	11.5
Other direct costs*, m MNT	5.3	5.3
Total cost, m MNT	5.3	16.8
Net income, m MNT	12.6	17.2

*Costs include feed, transportation, veterinary and fuel. Herders' living costs not included

The advantages of lamb production are not limited to reduced grazing pressure, increased meat supply and income for herders. Because lamb meat is low in cholesterol, it is very important for the health of the population of Mongolia, where cardiovascular disease is high. Health benefits of lamb include:

- The cholesterol amount of 100 gram lamb contains 96 mg of cholesterol;13 mg less than in mutton
- Lamb has very little marbling, 64% of the fat is mono or polyunsaturated fat, which is the "good" fat in diets
- Lamb is rich in high-quality proteins, B vitamins, zinc, and iron
- It has the proper ratios of all 8 amino acids needed by the body
- Lamb is also full of conjugated linoleic acid (CLA) which the human body cannot synthesize . CLA is a potent antioxidant and an effective immune system enhancer.

Because of its health benefits, lamb is a third more expensive than mutton in developed markets, so it can substantially increase meat export earnings.

4. **Positive impacts on the national economy**

The environmental and economic impacts of lamb production are high. Adjusting the number of livestock to the carrying capacity of pastures will put the livestock sector on the path of sustainable development, protect biodiversity, adapt to climate change, stabilize meat supply and prices, and be an important step towards improving the health of the population. The economic value of all these is measured in hundreds of billions per year.

Therefore, it is highly desirable to introduce the model throughout the country at the level of the national program. Based on the 16.2 million sheep mentioned above, 63.8 thousand tons of high-quality concentrates are required to feed 5.7 million ewes with male lambs.

It can be best implemented through a well-designed and phased public-private-community partnership program focused on training for herders and consumers, production of good quality fodder, supply of rams; involving herders, meat processors, feed producers, animal breeders and government regulators; and funding sourced from the budget and donor programs.

CENTER FOR POLICY RESEARCH
www.cpr.mn