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OPPORTUNITIES TO DEVELOP THE VALUE CHAIN OF LIVESTOCK PRODUCTS IN MONGOLIA

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Abstract: in this paper presented are key results of the analysis and survey studies on livestock products value chain assessments and suggestions on its improvement. Based on the analysis and survey studies conducted, several initiatives and interventions including; increasing the output of livestock products, enhancing the value chain of products like meat, milk, and fine wool have been proposed. The business models of beef, mutton, and lamb feedlots, local livestock breeding units, inter-soum slaughterhouse, dairy production and wool production for the value chain development of the livestock originated products have been developed.

Keywords: herders' livelihood, livestock originated product, business model, beef and lamb fattening, livestock productivity, inter-soum slaughterhouse, dairy production, wool production

ВОЗМОЖНОСТЬ РАЗВИТИЯ ЦЕПОЧКИ ДОБАВЛЕННОЙ СТОИМОСТИ ПРОДУКЦИИ ЖИВОТНОВОДСТВА В МОНГОЛИИ

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Аннотация: в данной статье представлены основные результаты анализа и опроса по оценке цепочки создания стоимости продуктов животноводства и предложения по ее улучшению. На основе проведенного анализа и опроса было предложено несколько инициатив и вмешательств, включая: увеличение производства продуктов животноводства, улучшение цепочки создания стоимости таких продуктов, как мясо, молоко и тонкая шерсть. Разработаны бизнес-модели откормочных площадок для говядины, баранины, ягнятины, местных животноводческих хозяйств, межсомонных бойней, молочного производства и производства шерсти для развития цепочки создания стоимости продуктов животноводства.

Ключевые слова: средства к существованию животноводов, продукт животноводства, бизнес-модель, откорм говядины и баранины, продуктивность скота, межсумонная бойня, молочное производство, производства шерсти

МОНГОЛИЯДА МАЛ ЧАРБА ПРОДУКЦИЯЛАРЫНЫН КАЛК СИНЖИРИН ӨНҮКТҮРҮҮ МҮМКҮНЧҮЛӨРҮ

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Аннотация: бул макалада мал чарба азыктарынын нарк чынжырчасын баалоо боюнча талдоо жана изилдөөлөрдүн негизги натыйжалары жана аны жакшыртуу боюнча сунуштар берилген. Жүргүзүлгөн талдоо жана сурамжылоонун негизинде, анын ичинде бир нече демилгелер жана кийлигишүүлөр; мал чарба продуктыларын эндуррууну кебейтуу, эт, сүт, уяц жун сыяктуу продукциянын езуне турган нарк чынжырын кецейтуу сунуш кылынды. Мал чарбасынан алынган продукциянын кошумча нарк чынжырчасын өнүктүрүү үчүн уй, кой, козу бордоо аянттарынын, жергиликтүү мал чарба бөлүмдөрүнүн, сумдар аралык мал союунун, сүт жана жүн өндүрүүнүн бизнес моделдери иштелип чыккан.

Өзөктүү сөздөр: малчылардын тиричилиги, мал чарба продукциясы, бизнес модели, уй жана козу бордоп семиртүү, малдын продуктуулугу, сумдар аралык касапкана, сүт өндүрүү, жүн өндүрүү

Introduction

As of 2022, Mongolia's livestock number (71.1 million) exceeded the pasture carrying capacity by 33 million sheep equivalent heads, exceeded by 2-7 times in the most aimags, and more than 70 percent of pastureland is degraded overall (Mongolian2022). These numbers indicate that the continuously increasing grazing pressure truly highlights the need for urgent and concrete actions to address the challenges. On the other hand climate change, recently noted in Mongolia affects environmental conditions consequently biodiversity weakening and pastureland degradation. The average annual air temperature increased by 2.24 o C between 1940 and 2015 (<https://www.adb.org>). As herders' livelihoods heavily rely on the income

generated from the livestock, it is challenging to persuade them to reduce or control the livestock number. Livestock productivity has decreased from year to year due to the increased heads of livestock, decreasing the carrying capacity of pastureland (Densambuu, B.,2018).

The way of herding animals in Mongolia is nomadic way. It has been a challenge for Mongolia to develop and produce value-added livestock products for decades.

Herder household incomes can increase both from higher prices of traditional products and from diversification to new products that become profitable. Mongolian herder households' income consists of 80% of livestock ordinated and, the rest of 20% of non-livestock incomes. In livestock-related income

accounts for 53% of meat and livestock sales, 22% from the income from wool and cashmere, 15% from the sale of milk and dairy products, and the remaining 10% from the sale of leather (Herder, 2016), (HEA).

It is possible to increase livestock income and reduce grazing pressure by increasing animal productivity via breed improvement, circular livestock economy for young animal feedlots, and semi-intensification livestock husbandry (Vision-2050. 2022). Innovative approaches and advanced technology should be introduced and marketed for the processing of handicraft products such as animal skin and felt products.

Technological interventions require an understanding of how inputs interact within a holistic system that considers market and economic interactions, social impacts, and the institutional base. Investments in processing innovations can improve market access and generate income-generation opportunities.

Materials and methods of the study

The following methods and methodologies, commonly applied for conducting analysis and diagnosis on livestock value chain:

In marketing, a company’s value proposition is the full mix of benefits or economic value which it promises to deliver to the current and future customers (i.e., a market segment) who will buy their products and/or services.

A value chain represents all the activities and processes involved in creating a product or performing a service. As such, it encompasses every stage of the product's or service's

lifecycle, from design to production and distribution. In seeking higher profit margins or a competitive advantage, companies can conduct a value-chain analysis to identify each step (or link) in the chain and look for ways to improve it (Mongolian, 2010).

Questionnaires on household income and expenses from herdsmen and local people engaged in animal husbandry and environmental activities in western region of Mongolia were conducted by random sampling and the results were compiled and analyzed. In a participative approach, opinions were gathered, summarized, and assessed during a meeting with local entrepreneurs and government officers.

Results of the study

Livestock product’s value chain assessment and possible improvement:

a. Strengthen livestock meat value chains including beef and mutton at the local community level

In Mongolia, an average of 20 million animals are slaughtered for food, and 594 thousand tons of meat are processed each year, with each person consuming an average of 70 kg of meat.

Approximately 4% of total meat production is exported each year, with the remaining 96% consumed domestically (Mongolian, 2022). Because beef is a strategic food, annual quotas for the amount of meat exported are set. The majority of meat consumed domestically is beef and mutton. In recent years, the population's income has increased, while the consumption of protein

Table 1. The total amount of meat processed in Mongolia each year

#	Indicators	2018	2019	2020	2021	2022	Average
1	Processed meat, thousand/tons	515.2	545	744.5	512.7	654	594.3
2	Beef, thousand/tons	126.6	114.7	158.5	110.6	140.2	130.1
3	Mutton and goat meat, thousand/ tons	236.6	258.1	343.1	240.8	311.1	277.9

Source: Mongolian Statistics, 2022

foods has increased, market demand for meat has increased, and the prices of various types of meat have risen.

In Mongolia, approximately 900,000 to 1,000,000 tons of meat are provided to the local market each year through the slaughter of around 20 million animals. Within the same year, meat consumption consisted of 16.6 % horses, 22.6% cattle, 13.7% camels, 32.2% sheep, and 27.8% goats (Mongolian, 2022).

Currently, 136 slaughtering-meat processing plants have been established in Mongolia, of which 70 are slaughterhouses and cooling plants, 25 of which are located in Emeelt and Nalaih near Ulaanbaatar. About 10 percent of the meat that is slaughtered and sold in the market goes through the slaughterhouse, and the remaining 90 percent is slaughtered in the field. (<https://unctad.org>).

It is recommended to organize beef fattening at 18-24 months of age for 45 days, with an average daily growth of 0.87 kg/day, in order to improve herder household revenue from beef and mutton sales. Another intervention is lamb fattening at 8 months of age, followed by direct selling to slaughterhouses. It will take 35 days to fatten a lamb, with an average daily increase of 0.17kg/day (Gendaram, Kh. 2009).

Assist in the building and operation of inter-soum slaughterhouses that are permanently positioned in inter-sums with many livestock farms in order to boost the market value of herders' red meat.

b. Support compartmentalization lamb feedlots business model

The market for lamb meat is rising, however lamb live weight does not meet the acceptable market weight before the age of 30 months (Gendaram, Kh. 2009). As a result, the lambs must be sold at a later age. One possible solution to this problem is to rear lambs intensively (by early calving and fodder feeding) and fatten them to the necessary weight by August in the fall. These lambs are suitable for the special needs market. Farmers' marketing cooperatives can also be established, with 450-600 lambs fattened at a time on a disease-free farm (Herder household income need assessment 2023).

A lamb fattening feedlot is an important aspect of the animal husbandry industry. The lamb fattening industry produces high-quality, high-demand meat as well as high-quality skin and wool.

However, lamb fattening, like any other business, has strengths, weaknesses, opportunities, and dangers that entrepreneurs must examine before establishing the lamb fattening business. Strengths include environmental friendliness and the provision of high-quality meat, skin, and wool; weaknesses include a lack of domestic market demand, disease control challenges, and market price fluctuations; opportunities include increasing foreign market demand, accelerating turnover herd rotation, and introducing Halal product standards; threats include disease outbreaks, meat export bans, and natural disaster risk. The lamb fattening feedlot business is a wonderful enterprise with tremendous market prospects.

The development of a business model canvas for a lamb fattening feedlot business allows for strategic management, improved decision-making, situational awareness, and the development of an effective plan. A business may better comprehend its capabilities for success and development by holistically mapping out essential components such as client segmentation, value propositions, and critical operations.

c. Financial support of local livestock breeding-technological units

A commercial firm that provides professional animal breeding services to livestock producers and local communities is known as an animal breeding-technological unit.

Animal Breeding-Technology Service Unit Business Canvas Model Template serves as a road map for the effective execution of a business. Livestock breeders desire to develop their breeds and raise their output.

However, the business of supplying animal breeding-technological services is insufficient to meet the local demand. The business canvas of a breeding service provider is an ideal place to start since it helps producers think through their business strategy and

construct an effective overview of all aspects of breeding business operations.

d. Support to establish of Inter-soum slaughterhouse that works around year

Encourage public-private investment in a slaughterhouse-cooling facility in remote soum areas, as well as establish conditions for year-round direct supply of meat animals from herder communities. Soum herders in the area supply animals to the slaughterhouse. Establishing this sort of industrial investment in places with a large concentration of animals can be a solution that promotes animal circulation, resulting in a considerable rise in herders' revenue in the areas.

With the growing need for fresh, safe, nutritious, and high-quality animal red meat, inter-soum slaughterhouse businesses offer a variety of services including livestock slaughtering, classifying meat, packing, and freezing meat.

Due to a lack of nearby slaughterhouses and organizations to acquire and prepare meat, herders, and people living in remote places from the major market are unable to sell their animals in a timely way.

As customer demand grows for properly slaughtered, processed, packaged, and frozen meats, investing in an inter-soum slaughterhouse business might be an excellent opportunity.

After developing all components of the business model canvas for the inter-soum slaughterhouse partnership, it is clear that the consumer segment and value proposition should receive special attention, as they will

influence the success of the meat processing and slaughterhouse operations.

e. Strengthen milk and dairy product value chains involving local communities

Context of the dairy sector in Mongolia

Although milk and dairy products are a major source of livelihood for herders, they are unable to fully utilize their resources since they live in remote areas where roads, refrigeration, and transportation infrastructure are not well developed.

The availability of meat for the entire population of Mongolia exceeds consumption, according to a research table of food needs. However, the present output cannot fulfill the 336,000 tons yearly demand for milk and dairy products. The amount of processed milk and dairy products consumed per person as of 2022 is 34 kg, which is 4-5 times less than the recommended standard (Mongolian, 2022).

Milk producers

Herders, small and medium-sized dairy farms, cluster farms, and milk collecting locations jointly owned by herders are the key participants in the milk market.

Establish milk collecting and cooling places among herders organized in cooperatives, partnerships, and groups to support the economic concept of selling milk to companies. Local brand dairy goods such as pasteurized raw milk, dry and wet curds, butter, cheese, and ghee are produced in factory conditions by establishing locally sourced raw milk processing factories in remote regions.

Provide a QR-code tracking system to

Table 2. Food needs of Mongolian people, as of 2022

Products	Total population	Standard population	Food norm of standard person, kg	The total annual demand of Mongolia, tons
Meat	3457500	2,627,700	73	191,822
Milk & dairy product	3457500	2,627,700	128	336,346
Flour	3457500	2,627,700	127	333,718

assure the quality, safety, and well-being of milk and dairy products. Make legislation that manages milk incentives for milk delivered to close milk processing plants.

f. Suggested intervention or economic initiatives for strengthen of dairy product value chains

Support to establish local dairy processing plants (private labeling local brand dairy products such as wet curd, butter, goat dry curd, ghee and yak soft cheese)

Starting a local dairy processing facility based on milk resources in Mongolia's rural locations is a novel initiative that guarantees to provide customers with fresh, locally produced brand, organic, safe, and high-quality dairy products such as wet and dried curds, cheese, butter, sour cream, and goat ghee.

The processing plants will make raw milk into a variety of goods that will be marketed to local and urban food markets, grocery stores, health food stores, and restaurants.

A dairy processing plant business's assets include the availability of local community-based raw materials and the capacity to generate local brand private branded dairy products. However, such businesses may suffer disadvantages such as regulatory control limits, as well as changes in milk prices. Opportunities for expansion in dairy processing facilities include growing dairy goods by developing private-labeling local brand dairy products, as well as large domestic demand for local dairy

products.

The ever-growing demand for organic and farm-fresh dairy products, the opportunities for starting locally milk sourced dairy processing plant business are abundant in Mongolia. With that in mind, starting local dairy processing plants could be a great business for entrepreneurs looking to capitalize on the market growth.

This business canvas concept focuses on a local dairy processing factory that will serve local and urban consumers with locally branded, organic, safe, and fresh dairy products. The local dairy processing business will use raw milk collected locally to make dairy products such as packaged pasteurized raw milk, wet and dried curd, butter, sour cream, soft cheese, goat and yak ghee. It will subsequently be marketed to local and urban food markets, food grocery shops, raw materials for some of the larger dairy processing companies, health food stores, and restaurants, with delivery services available to clients in the surrounding regions. A company's profit potential may be maximized by including client groups, resources and partner networks, products and services supplied, and distribution methods. The dairy processing industry can remain competitive in the market and capitalize on current possibilities by developing value propositions and pricing strategies that match the demands of customers.

g. Developing of wool value

Table 3. Amount of cashmere and wool produced and exported by Mongolia in the last five year

#	Paragraph	2018	2019	2020	2021	2022	Average
Harvested wool and cashmere							
1	Shepp wool, thousand/ton	515.2	545	744.5	512.7	654	594.3
2	Cashmere, thousand/ton	10	10	10.8	10.1	9.7	10.1
Exported wool and cashmere							
3	Washed cashmere, tons	5286.6	5688.6	6339.8	6026.9	6426.7	5953.7
4	Washed sheep wool, thousand tons	12.2	14.5	8.5	5.3	17.7	11.6
5	Washed camel wool, tons	700	1050.8	836.7	329.1	2174	1018.1
6	Washed horse mane, tons	900	409.4	960.9	157.7	1537	793.0

chains

Mongolian wool and cashmere market conditions

In Mongolia, around 33-34 thousand tonnes of sheep's wool, 9.7-10 thousand tonnes of cashmere, and 2 thousand tonnes of camel wool have been collected [1]. Wool and cashmere processing plants produced textiles made of wool and fine wool, while raw wool and cashmere were washed for export.

The 30th Parliamentary Resolution of 2011 prohibited the export of raw cashmere and other non-processed wool of animal origin, therefore promoting domestic production and increasing jobs [11]. As a result, all types of cashmere are now exported from our country. Almost half of the cashmere and wool produced each year is processed and turned into finished items.

By 2020, the wool processing industry will produce 1.6 million square meters of carpet, 71,400 tons of washed wool, 3,289 tons of combed wool, 3,293 tons of yarn, 1,243,000 pieces of knitwear, 2,500,000 pairs of woolen socks, 817,000 square meters of textiles, and 500,000 square meters of carpet. 2,000 tons of wool fertilizer, 1,260.0 thousand m² of non-woven products, 4,106.7 thousand m² of felt, 1,620 thousand m² of insulation material, and the capacity to create woolen fabric are all installed [12].

The best cashmere is found in cooler climate animals, particularly young and female animals. Yak distributed in Mongolia's Altai, Khangai, Khuvsgol, and Khenti mountain regions has particularly good cashmere, while the wool of young camels has a high cashmere percentage. However, the quality and worth of camel wool diminish as a result of improper preparation.

h. Suggested intervention or economic initiatives for strengthen of wool value chains

Acquiring innovative methods by combing yak and baby-camels to local communities

Acquiring innovative methods and best practises for preparing wool by combing yak and baby-camels and selling the high-quality

combed yak and camel wool to high-value end cashmere producers at premium pricing.

The development of an agreement for the duty-free supply of wool goods to the American and European markets, as well as state aid for the renewal and modification of legislation, acts that prevent wool and cashmere export and commerce.

The global market demand for cashmere wool, which is made by combing yak and baby camel wool, is increasing all the time, but herders are still passing up a great opportunity to earn extra money because they lack the know-how to prepare high-quality wool by combing yak and baby camel wool.

Preparing wool by combing yak and baby camel wool, like any other business, has strengths, constraints, opportunities, and threats that entrepreneurs must examine before launching the company. Herders have a lot of cashmere potential livestock like young yak and baby camels, and there is an increasing interest in yak and baby camel combing to prepare high-quality wool; weaknesses are a lack of knowledge about how to prepare combed yak and camel cashmere and a lack of working force for these work; opportunities are increasing foreign market demand, and the government encourages subsidies to prepare yak and camel wool; threats are outbreak disease and natural dislocation.

Mongolian yak and camel husbandry is concentrating on applying sustainable practices that enhance their business line while also being environmentally friendly. Preparing exquisite wool from yak and baby camel wool is a more sustainable and successful economic concept for herding communities.

The development of a business model canvas for a yak and baby camel wool combing company allows for strategic management, improved decision-making, awareness, and the establishment of an effective business. The company may better comprehend its capabilities for success and development by holistically mapping out essential components such as client segmentation, value propositions, and critical operations.

Conclusions

The value chain analysis of animal-derived products like meat, dairy, and wool reveals several key limitations. Some examples include herders not following production standards for livestock products and raw materials; outdated product processing technology, traditional practices that don't meet consumer and exporter requirements; and milk and dairy products being prepared in herders' homes, which hinders the development of value chains.

Over the past three decades, livestock live weight and productivity have decreased due to neglecting animal breed improvement and a lack of sufficient pasture capacity and nutrition. As a result, it now takes 36-48 months for young animals to reach the desired market weight. Leading strategies for lamb fattening feedlot business models are: improving sheep breed improvement, introducing lamb intensive raising methods, and local communities jointly organize compartmentalization lamb fattening feedlot before eight-month age.

By strengthening the guarantee, keeping an accurate tracking system will raise the value and sales of locals' livestock products in the ecological corridor and the protected area. Meat and dairy products that come from animals require traceability systems to accurately enter the data.

With the assistance of the Permanent Funding Program for Nature Protection for TNC, it is possible to strengthen value chains of meat, milk, and wool by implementing interventions such as compartmentalization of lamb and beef feedlots, the establishment of an inter-soum slaughterhouse with continuous operation, livestock breed improvement, the establishment of a small dairy factory based on local milk resources, the acquisition of innovative methods by combing yak.

The competitive strategies for compartmentalization beef feedlot are high demanded, high quality grass-fed beef from protected feedlot will be sold to end consumers (beef niche market, beef restaurants, sorting beef stories) and meat processing companies, maximizing sales beef meat through product

diversification such as marbled beef meat, classified young beef meat and marketing on safe, healthy product from protected feedlots.

In order to increase the export of sheep and goat meat, it is necessary to approve the national standards of Halal products in accordance with international standards, introduce a system for monitoring Halal products, and strengthen the capacity of the national Halal certification institution.

Competitive strategies for local dairy processing plants are to create high demanded local brand private labeled dairy products, increase the competitiveness of the dairy processing plants by introducing new advances in milk processing technology, can make contracts with herder's cooperatives for the supply of milk at constant fixed prices. By creating value propositions and pricing strategies that meet the needs of customers, the dairy processing business remains competitive in the market and capitalizes the existing opportunities.

By introducing the innovative methods and best practices of preparing fine wool from combing yak and baby-camels to local communities, then they sell the high-quality combed yak and camel fine wool to high-value, end wool producers at premium prices. The entrepreneurs may better grasp its potential for success and growth by mapping out the essential elements, such as client segmentation, value propositions, and critical operations, in an all-encompassing manner.

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