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Original paper

Options for Increasing Mongolia's Livestock Sector Exports - A Revealed Comparative Advantage Analysis

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Abstract
Mongolia is a country with rich natural resources, including more than 70 million domesticated animals. The livestock sector is the traditional economic sector of Mongolia, and it is a major food source of the nation. Currently, the country faces an overgrazing problem caused by an increase in the number of animals whereas rangeland carrying capacity is limited. Exporting more meat and other products of animal origin has the potential to reduce the livestock population to sustainable levels, reduce overgrazing pressure, and increase the country's export income. Policies aimed at promoting animal product exports should take the comparative advantages of different types of products of animal origin into account in order to maximize their impact. This paper aims to provide science-based evidence to support such policies by investigating the comparative advantage of meat and other selected products of animal-origin using the revealed comparative advantage index. Official statistics for 81 products over nine years were used for the data analysis. The results suggest that Mongolia's meat export policy should focus on large volumes and relatively lower processing level products in the short run and should shift to differentiated value-added products in the long run. We recommend that the Government of Mongolia improves its meat sector's regulation and develops formal supply chains in order to effectively monitor food safety and create high-quality Mongolian brand products of animal origin.

Keywords: meat export, trade analysis, comparative advantage, value chains

1 Introduction

The livestock sector of Mongolia was among the top three highest growing sectors in the country between 2000 and 2019. About 170,000 herding households are working in the livestock sector and are responsible for herding more than 70 million open-range pastoral livestock; the sector produces 90% of the total agricultural production [1]. Rangeland degradation caused by overgrazing is one of the greatest environmental problems that Mongolia is facing, in large part caused by the tripling of the livestock population from 1990 to 2019 [1]. According to various scientific studies, the livestock population is overstocked by more than 30 million heads compared to the carrying capacity of the rangeland [2, 3, 4, 5]. A recent study indicates that the rational number of livestock that would not degrade the rangelands given their carrying capacities is between 32.8 - 46.7 million livestock heads depending on the season [6]. Exceeding the carrying capacity of the pastureland causes scarcer fodder resources in the grassland and increased vulnerability to drought and *dzud (Dzud refers to a high winter/spring mortality of livestock caused by drought-induced poor rangeland conditions followed by cold winter conditions. Animals basically starve or succumb to disease)* natural disasters, which can cause the death of millions of livestock in a short period. According to the National

Rangeland Health Report published in 2015 and 2018, the percentage of degraded rangelands has declined from 65% in 2014 to 57% in 2017. However, compared with conditions in 2014, the degradation degree had increased. In 2017, 13.5% of the rangeland was slightly degraded, 21.1% was moderately degraded, 12.8% was heavily degraded, and 10.3% was completely degraded. The proportion of areas that were not degraded to slightly degraded rose by up to 10%, but the proportion of areas classified as heavily or completely degraded rose by 4.3 - 5.9% [5, 4].

No serious action has been undertaken so far by the Government of Mongolia to limit the growth of livestock in order to counteract the rangeland degradation caused by overgrazing [7]. The decline in rangeland health is the central challenge to sustainability of the livestock sector in Mongolia, and 'the control of livestock numbers is a fundamental pre-condition for effective rangeland management' [5]. It is clear that the number of animals cannot grow permanently given the present rangeland carrying capacity in Mongolia. Uncoordinated expansion of herd sizes will lead to deterioration in the welfare of the community of herders [4].

One of the main causes of the increase of livestock numbers and the concomitant overgrazing is the lack of markets to harvest annual natural increases in livestock population [7, 8, 9]. The growth of the domestic meat market demand lags behind the growth in livestock numbers. Mongolia annually slaughters nearly ten million animals for domestic meat consumption. The current stock's reproductive capacity of livestock is nearly three times the domestic demand [3].

One important option to reduce the pressure on the rangelands is the export of products of animal origin. During the socialist period before 1990, Mongolia annually exported ten million live animals to the Soviet Union in addition to products of animal-origin. This market closed after 1990, resulting in only a small export volume of live animals and animal originated products. This situation remained the same in recent years.

Mongolia should have a high potential for the export of products of animal origin because the country has a high number of open-range pastoral livestock and a vast territory to develop agri-business. Such exports could increase the value-added of the livestock sector by gradually shifting the focus from quantity to quality and would be a win-win situation for both the Mongolian livestock sector and the natural environment. Currently, the main export products of the livestock sector in Mongolia are meat, cashmere, and hides and skins [10]. The total export of the livestock sector was 561.5 million US dollars in 2018, which accounted for 8.0% of the total export of the country [11].

This study considers exports of meat and its byproducts and excludes cashmere and other fibers exports. The reason for this choice is that exports of meat and its byproducts contribute to a decrease in the number of livestock in the short run.

Meat export of Mongolia has been increasing rapidly since 2014. Meat is the second important export item after cashmere in terms of products of livestock origin in Mongolia. Meat export has increased from 2.8 thousand tons in 2015 to 70.0 thousand tons in 2018. Meat exports had a value of 160 million USD in 2018, i.e 28.5 percent of the total export value of livestock output. In terms of live animals, 4 - 5 million animals were slaughtered for export purposes in 2018 [12]. According to earlier research done by the Asian Development Bank, in which suitable herd sizes and herd structures aligned with each *aimag*'*s* (*Aimag is the largest administrative unit in Mongolia equivalent as province*) available rangeland carrying capacity was calculated, Mongolia should be able to produce 318,800 tons of meat (beef, horse, camel, sheep and goat meat) per year on average if herd sizes and herd structures would be aligned with the available rangeland reserves [13]. The number of livestock in 2018 was 1.6 times larger compared with that of 2012 when the research for this ADB study took place [13]. Therefore, the export potential of meat would have also increased by a similar ratio. The difference between the current export data and the potential export volume shows that there is an excellent opportunity to increase the export income of meat in Mongolia.

Boosting meat exports in the short run would contribute to reaching a level of sustainable production. Considering the biological reproductivity rate, the Government of Mongolia has imposed export quota for beef and horse meat, while sheep and goat meat do not have any quotas [14]. Mongolia is uniquely located between two large markets, i.e. Russia and China. It has significant opportunities to expand meat export to these two countries and to other countries that eat substantial amounts of sheep and goat.

The Government of Mongolia does have several policies to promote animal product export, but these policies make limited use of science-based evidence. In particular, research on comparative advantages could be used to identify the most promising products of animal origin for exports and the export partner countries. The objective of this study is to investigate the possibilities of increasing the export of Mongolia's livestock sector by investigating the comparative advantages of different animal products. In order to fulfill the research objective, the comparative advantages of animal products in Mongolia are compared with international levels. The concept of comparative advantage refers to the ability of a country to produce some good or service not only with higher productivity, as initially proposed by Ricardo (1817), but also with higher product differentiation than other countries in a given trade area (Lafay, 1987) [15, 16]. International trade is an essential source of wealth generation and an essential way to self-sustained growth and poverty reduction, particularly in low-income countries with small domestic markets like Mongolia [17, 18].

Since the pioneering work of Balassa (1965), the standard method for the measurement of comparative advantages is the calculation of a revealed comparative advantage (RCA) index on the basis of trade flows [19]. In this research, Balassa's measure of the revealed comparative advantage is applied to answer the research question 'Which types of animal-originated products of Mongolia are competitive in the world market?'. Time series and cross-section data for 81 products over 9 years was used for the data analyses. Data was gathered from the International Trade Centre, the National Statistical Office of Mongolia, and the Customs Office of Mongolia.

The remainder of the paper consists of four sections. Section 2 presents information on Mongolia's livestock sector and the export of animal products. The materials and methods of the study are presented in section 3. Section 4 presents and discusses the results of the data analyses, while the fifth section of the paper presents conclusions.

1. The Livestock Sector and its Exports

The livestock number of Mongolia has been increasing since 2010 and has doubled within the last eight years. In terms of the composition , sheep account for 45.5 percent in the total number of livestock in 2019, with goats accounting for 41.2 percent, cattle for 6.7 percent, horses for 5.9 percent, and camels for 0.7 percent (Figure 1). The proportion of large animals (such as cattle, horses, and camels) has rapidly declined, while the proportion of goats and sheep have increased. These changes in herd composition reflect market conditions. The impact of extreme weather conditions, which have the greatest impact on small ruminants, has been less significant over the past decade. Thus scientists warn that the appropriate ratio between sheep and goat (75:25) has been still lost with a ratio of 53:47 in 2019 [6]. The high number of goats brings more cash income to the herders from its cashmere, but it causes negative impacts on environmental sustainability.

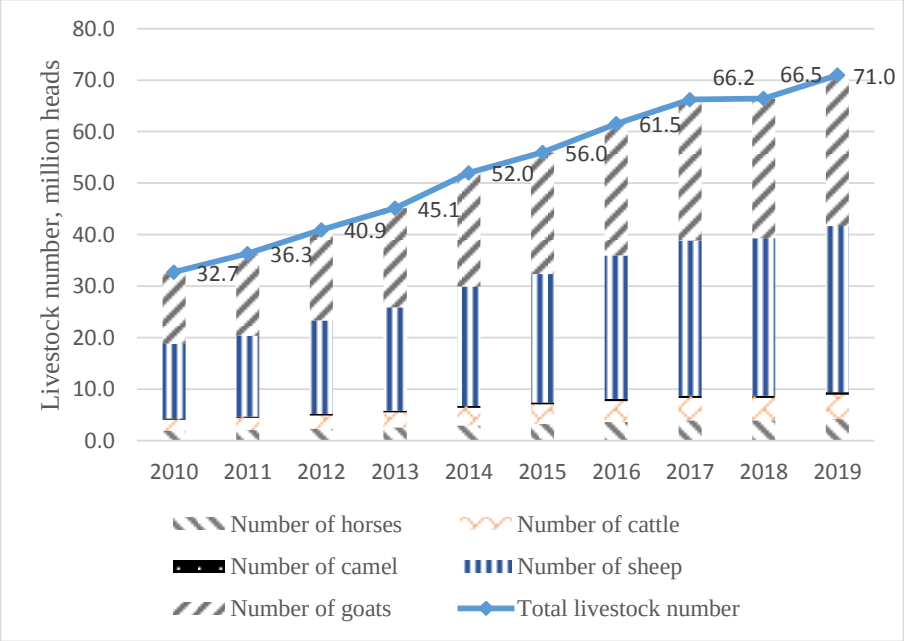

Fig. 1. Trends in livestock numbers, source: NSO data [8]

Animals provide a variety of products. There is a trade-off in terms of use of animals between animal's use for a continuous stream of earnings from products of animal origin and the sale of the live animals. Mongolian herders select the species of animals depending on both income requirements and the local environment [20]. In 2019, the sector produced 554 thousand tons of meat, 1074 million liters of milk, and 10 thousand tons of cashmere. All products of animal origin have registered steady growth since 2010, with the growth in output of livestock products primarily driven by the number of livestock rather than productivity [1]. Overall, the livestock sector remains characterized by low productivity due to underdeveloped animal health and breeding systems, high incidence of production- and trade-limiting animal diseases, lack of proper management of pastureland, and insufficient fodder and water supply. All these factors have substantially increased risk to herders' households, the quality of Mongolian livestock, and the health of the livestock industry.

Table 1. Export of Products of Animal Origin from Mongolia, US Dollar thousand

HS Code	Product label	2010	2011	2012	2013	2014	2015	2016	2017	2018
01	Live animals*	1412	56	36	33	38	3009	1539	110	221
02	Meat and edible meat offal	54385	24112	10355	11104	6802	10166	16406	54631	86027
05	Other products of animal origin	8940	12221	11031	11719	8051	8880	6961	6738	9644
15	Animal fats and oils …	1	11	17	1	0	1	149	20	1
16	Preparations of meat …	282	309	138	2	124	614	1589	8628	79658
41	Raw hides and skins …	31745	50761	30183	34827	35514	32779	24157	22662	16664
42	Leather: "travel goods, handbags, and similar containers; articles"	751	290	232	338	192	886	5864	770	211
64	Leather: "Sports footwear, footwear, parts of footwear"	549	1756	1001	771	655	860	1363	1593	1359

Source: International Trade Centre (ITC) www.intracen.org
Note: *The Government of Mongolia banned live animals exports since July 3, 2019

Due to improved animal health and lower occurrence of animal diseases, the export value of meat and other products of animal origin has increased the last three years (Table 1). The large difference between the current and potential export volumes (see Section 1) indicates that there is a great opportunity to increase the meat export income in Mongolia. The export dynamics of meat and meat products of Mongolia are closely related to the production technology used in animal husbandry. The meat of Mongolian animals is considered a pure and natural 'open range' product. As such it does not alwaysmeet international trade partners' requirements for veterinary medicine and food hygiene and quality. Increasing meat exports thus requires improvements in the health status and traceability of livestock. One of the major barriers to meat exports from Mongolia connects to foot-and-mouth disease (FMD) occurrence. According to the infectious nature of FMD and its occurrences in Mongolia, trade partner countries have implemented import bans on meat from Mongolia. Achieving FMD-free status from the World Organization for Animal Health (OIE) is a critical step, as all major international suppliers of meat to China have attained this status [20].

Mongolia has no registration or information system for approving or submitting the percentage of healthy livestock and the percentage of meat produced in disease-free regions. This lack has diminished the opportunities for expansion of the Mongolian meat export industry [21]. Currently, the cost of diagnosing animal diseases and taking preventive measures against animal disease is financed by the herders themselves instead of public agencies, which contributes to the spread of diseases and enables an environment for infection. The current state policy (and finance) of veterinary services focuses on post-disease treatment activities, disinfections, and cutting the spread of diseases rather than pre-disease control, early diagnosis, and preventive measures. This choice can be explained by the low veterinary budget per livestock unit. In order to resolve the problem, the Parliament of Mongolia approved the "Law on Protection of Livestock Health" and the "Law on Genetic Fund of Livestock" in 2017. The Government of Mongolia re-structured veterinary and animal health institutions and established the General Agency for Veterinary Services (GAVS) of Mongolia in 2018. The occurrences of major animal diseases have dramatically decreased in the last four years (Table 2).

Table 2. The occurrences of 'A-level' animal diseases in Mongolia

Diseases	2016	2017	2018	2019
Foot-and-mouth disease	4	67	61	0
Peste des petitis	11	15	5	0
Sheep Pox	53	37	1	0
Total	68	119	67	0

Source: General Authority for Veterinary Services, 2020

The areas of animal diseases narrowed in terms of geographical distribution during the last four years (Figure 2). In 2019 Mongolia was FMD-free while its two neighboring countries, the People's Republic of China and the Russian Federation, recorded occurrences of FMD [22].

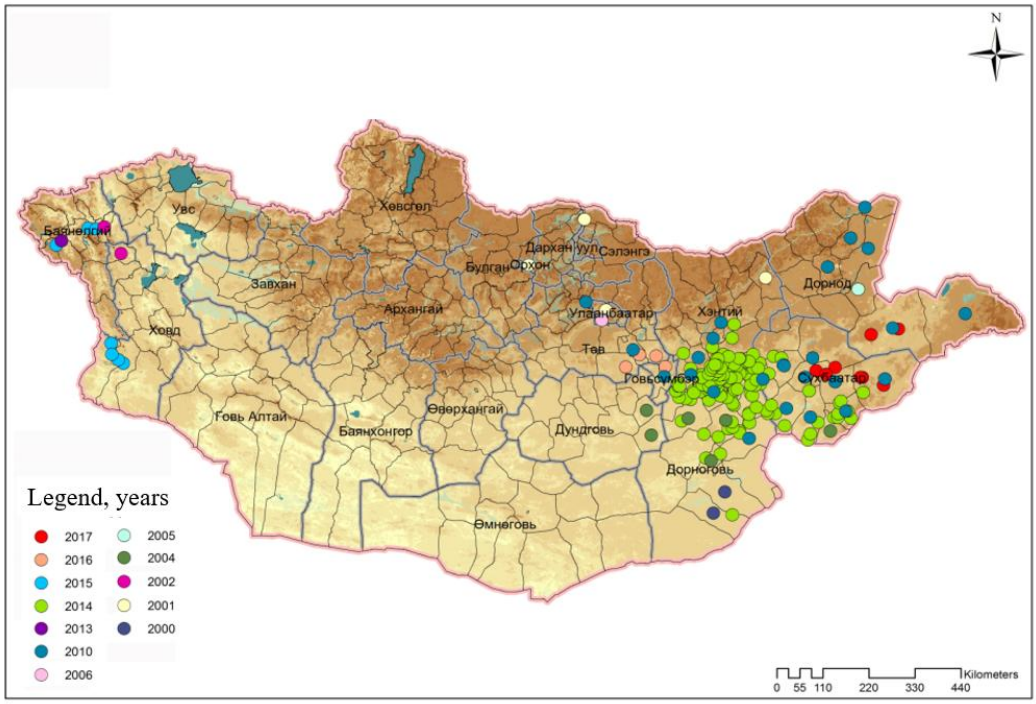

Fig. 2. The occurrences of the foot-and-mouth disease by location between 2000 and 2017

Source: GAVS, 2020

2 Materials and Methods

Data

The study uses data for 81 products over the years 2010-2018. The main data source was the International Trade Centre database of the National Statistical Office of Mongolia and the Customs Office of Mongolia. The selected date is only for products of animal origin (excluding any fibers) and uses the six-digit code Harmonized Commodity Description and Coding System (HS) for the product classification. The data show that Mongolia exported goods to 56 countries during this period. The main export partners were only seven countries, while each of the other countries accounted for less than 1% of the export share (Figure 3). The largest share by far was exported to the People's Republic of China (60.4%), followed by the Russian Federation (11.8%) and Italy (8.1%).

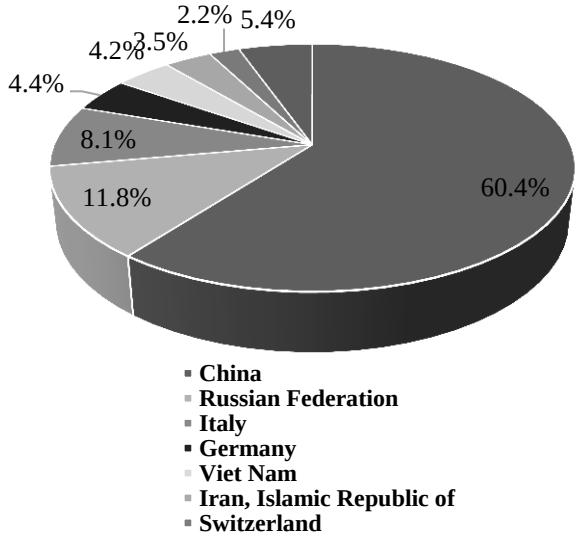

Fig. 3. Average share of exported products of animal origin from Mongolia by country, 2010-2018, Source: Customs Office of Mongolia [23]

3 Research methodology

Our research focused on estimating the comparative advantage of the country in order to obtain more insights into the Mongolian potential within an increasingly competitive international environment. Comparative advantage occurs whenever a country has the ability to produce a good or service relatively more efficient or with lower opportunity costs than other countries. In other words, if a country can produce a good at a lower cost relative to other countries, then that country has a comparative advantage in that good and should dedicate more of its resources to the production of that particular good [15]. By trading that good, the country can obtain other goods at a lower price in exchange for the goods in which it has a comparative advantage.

A popular approach to estimating comparative advantage is using Balassa's measure of revealed comparative advantage as abbreviated RCA [19]. This measure, sometimes called the Balassa index, is defined as the share of a good in a country's exports divided by the share of that good in world exports. The Balassa index measures an industry's export share divided by the export share of the same industry in the world:

$$RCA_{ij} = \frac{E_{ij}/E_i}{E_{nj}/E_n} \quad (1)$$

where E_{ij} denotes the exports of j^{th} products of country i, E_i denotes the total export of country i, E_{nj} denotes the exports of j^{th} products of the world and E_n denotes the total export of the world.

Following Balassa (1965), comparative advantage is 'revealed' if RCA>1. If RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or industry [19].

4 Results and Discussion

To answer the research question 'Which type of animal-originated products of Mongolia are competitive in the world market?', RCA_{ij} was calculated using equation (1) for 81 products exported from the livestock sector of Mongolia over nine years (2010-2018). Detailed results are reported in Annex 1.

Based on the RCA index estimation, products of animals origin can be divided into two different value chains: i) meat (principal product) and ii) hides and skins (byproduct). The meat value chain starts from a live animal (HS01), continues with meat and edible meat offal (HS02), followed by other animal origin products (HS05), and finishes with preparations of meat (HS16). The hides and skins value chain starts from raw hides and skins (HS41) and has articles of leather as final products (HS42 and HS64). Articles of leather consist of two HS codes, specifically HS4201 and HS6403. HS4201 products are handbags, cosmetic bags, shoulder strips, travel bags, belts, etc. HS6403 products include mainly sports footwear and components of footwear. Mongolia exported 81 types of products originating from meat and hides and skins during the period 2010-2018 although not all of them have a comparative advantage. The RCA estimation results show that Mongolia tended to increase value-added product exports during the selected years. For instance, the RCA index of prepared meat products (HS160210, HS160250, HS160290) show an increasing trend over time (Annex 1).

In the next step, the overall average RCA index for all products for the period 2010-2018 was estimated, and the products with average comparative advantage (RCA) > 1 during that entire period were identified. This step resulted in 21 products that had an average comparative advantage (Annex 2). The results indicate which products within the two value chains identified above had an average comparative advantage during the examined period. As can be seen from the table in Annex 2, none of the articles of leather as final products (HS42 and HS64) had an average comparative advantage during 2010-2018.

5 Conclusion

Mongolia faces rangeland degradation due to overgrazing, which leads to uncertain long-term development of the livestock sector. According to the average revealed comparative advantage (RCA) index over the period 2010-2018, 21 animal products have a comparative advantage in the world market. These products comprise two important streams of value chains: i) meat and ii) hides and skins. These value chains show that there exist possibilities to produce and export more added-value products of animal origin. Therefore, promoting exports of these products can be an important way to reduce the high pressure on Mongolia's rangelands within a relatively short period of time.

The government of Mongolia is aiming to ensure the sustainability of the livestock sector to secure the livelihoods of the herders' households and improve economic opportunities within the sector. One of their major policies is to increase resilience to climate change by addressing overgrazing and balancing the livestock number with the rangelands' carrying capacity. In this paper, we assumed that an increase of meat export should support decreasing livestock numbers to numbers that would be in balance with the carrying capacity. However, promoting exports will need to be combined with appropriate rangeland management policies, such as a user fee (pasture tax) to control the overgrazing problem. Without such regulations, boosting exports can worsen the overgrazing and land degradation problem by incentivizing herders to have more livestock [7].

Possible policies that would support the export support of meat and other products of animal origin in this context are developing a meat export industry together with strategic animal breeding, reintroducing livestock tax and supporting the growth of more productive animals among others. Our findings suggest that Mongolia's meat export policy should focus in the short run on the large volume of products that have a relatively low level of processing; in the long-run, the policy should encompass a gradual shift to the export of differentiated value-added products rather than large volumes of products with low levels of processing.

Finally, we recommend that Mongolia improves its meat sector regulation and develops formal supply chains in order to both effectively monitor food safety and create high-quality Mongolian brands. Before trading animals or products of animal origin, any exporting country needs to meet a satisfactory level of animal health status and meet both the OIE and importing country's standards. In most cases, import regulations reflect to a large degree the effectiveness of the sanitary procedures undertaken by the exporting country, both at its borders and within its territory.

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Annexes

Annex 1. Results of Balassa's Revealed Comparative Advantage (BA65) index for animal products in Mongolia, by product type and year

No	HS code of products	RCA								
		2010	2011	2012	2013	2014	2015	2016	2017	2018
HS01 Live animals										
1	'010110	1.378	0.011	0.000	0.000	0.000	0.000	0.000	0.00	0.000
2	'010121	0.00	0.00	0.000	0.016	0.000	0.428	0.402	0.031	0.000
3	'010129	0.00	0.00	0.174	0.126	0.071	0.884	0.037	0.232	0.367
4	'010190	5.814	0.187	0.000	0.000	1.313	420.8	240.8	0.000	0.000
5	'010290	0.000	0.000	0.000	0.000	0.000	0.076	0.000	0.000	0.000
6	'010410	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.079
7	'010420	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
HS02 Meat and edible meat offal										
8	'020110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	'020120	0.00	0.00	0.00	0.00	0.00	2.12	0.00	0.00	0.01
10	'020130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
11	'020210	146.4	112.8	27.68	0.00	0.00	0.00	0.00	12.03	1.76
12	'020220	2.61	34.54	9.18	0.00	2.88	0.00	3.20	1.31	0.42
13	'020230	0.03	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.35
14	'020410	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	'020421	14.76	0.00	0.00	0.00	0.00	0.00	0.63	0.76	2.53
16	'020422	0.35	0.00	0.00	0.37	0.00	0.00	0.00	3.11	2.59
17	'020423	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25
18	'020430	9.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	'020441	58.26	2.76	0.00	8.01	0.00	0.10	1.02	0.00	8.85
20	'020442	8.19	0.11	0.60	3.59	0.00	0.00	0.20	7.55	9.57
21	'020443	1.06	0.10	0.00	0.07	0.00	0.00	0.00	0.00	0.40
22	'020450	402.0	11.72	19.87	0.00	0.00	1.01	1.46	0.00	21.21
23	'020500	200.4	58.74	36.00	70.68	34.61	67.42	125.88	302.0	364.9
24	'020610	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13
25	'020621	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	'020622	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	'020629	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
28	'020690	43.32	3.24	9.00	21.94	2.99	1.84	1.24	3.23	25.95
HS05 Products of animal origin, not elsewhere specified or included										
29	'050400	11.81	9.77	9.42	10.98	5.28	7.31	5.19	3.58	4.21
30	'050690	26.82	5.27	5.99	0.03	0.14	0.17	3.28	2.60	11.20
HS15 Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal….										
31	'150290	0.00	0.00	0.05	0.00	0.00	0.05	6.10	0.00	0.02
32	'151620	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00
33	'151800	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HS16 Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates										
34	'160100	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.07	0.33
35	'160210	0.00	0.00	0.00	0.00	0.00	0.27	5.08	66.36	90.04
36	'160220	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00
37	'160249	0.12	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00
38	'160250	0.38	0.06	0.13	0.00	0.16	0.76	1.86	5.15	30.53
39	'160290	2.01	4.07	1.05	0.00	0.00	0.00	1.04	14.74	281.7
HS41 Raw hides and skins (other than furskins) and leather										
40	'410120	14.93	7.10	6.92	13.76	7.81	6.83	39.89	5.21	0.03
41	'410150	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.21	0.00
42	'410190	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.45	0.00
43	'410390	2.57	1.92	1.09	2.28	0.48	0.80	1.97	3.33	2.52
44	'410411	13.82	11.42	5.92	6.86	6.77	10.13	13.29	10.81	10.96

45	'410419	0.00	3.58	6.10	0.19	0.10	0.00	0.00	0.00	0.00
46	'410510	166.5	175.7	132.6	154.7	105.6	158.2	28.20	40.56	39.08
47	'410621	353.7	155.9	202.4	259.3	311.7	407.3	180.0	174.9	160.5
48	'410622	0.00	0.00	1.16	0.00	0.04	0.20	0.00	0.28	0.61
49	'410691	0.00	0.00	0.00	75.60	0.00	65.09	0.00	0.00	0.00
50	'410711	0.00	0.00	0.00	0.01	0.00	0.51	0.00	0.00	0.00
51	'411200	0.67	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02
52	'411310	0.00	0.00	0.00	0.00	0.00	0.12	0.16	0.02	0.11
HS42 Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles ..										
53	'420100	0.03	0.02	0.07	0.06	0.16	0.01	0.06	0.20	0.02
54	'420211	0.00	0.01	0.02	0.07	0.00	0.12	0.06	0.12	0.00
55	'420219	0.27	0.07	0.08	0.21	0.02	0.01	2.02	0.24	0.01
56	'420221	0.00	0.04	0.03	0.06	0.00	0.10	0.02	0.02	0.00
57	'420222	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
58	'420229	0.06	0.03	0.01	0.03	0.02	0.00	0.02	0.08	0.02
59	'420231	1.09	0.07	0.03	0.02	0.02	0.10	0.03	0.04	0.04
60	'420232	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
61	'420239	0.03	0.04	0.06	0.07	0.02	0.04	0.66	0.31	0.04
62	'420291	0.06	0.01	0.00	0.00	0.01	0.01	0.02	0.00	0.01
63	'420292	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	'420299	0.12	0.17	0.01	0.03	0.00	0.03	0.05	0.04	0.05
65	'420310	0.03	0.02	0.05	0.04	0.04	0.14	5.47	0.13	0.02
66	'420329	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
67	'420330	0.23	0.03	0.04	0.04	0.00	0.18	0.15	0.13	0.04
68	'420340	0.00	0.00	0.00	0.00	0.03	0.00	0.02	0.03	0.01
69	'420500	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.02	0.01
HS64 Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles ..										
70	'640319	0.00	0.00	0.03	0.04	0.00	0.02	0.04	0.06	0.00
71	'640340	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.00
72	'640351	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
73	'640359	0.02	0.30	0.01	0.00	0.00	0.01	0.02	0.13	0.27
74	'640391	0.00	0.00	0.01	0.01	0.00	0.02	0.01	0.01	0.01
75	'640399	0.00	0.00	0.03	0.02	0.00	0.02	0.02	0.02	0.00
76	'640419	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	'640510	0.00	0.01	0.00	0.00	0.01	0.00	1.28	0.71	0.26
78	'640520	0.04	0.02	0.04	0.00	0.00	0.01	0.00	0.00	0.00
79	'640590	0.91	0.57	0.26	0.60	0.83	1.38	1.22	1.39	1.24
80	'640610	0.00	0.81	0.34	0.00	0.00	0.00	0.00	0.00	0.00
81	'640690	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02

Annex 2. The selected livestock-oriented products that are competitive in the world market

#	HS code	Product label	RCA*ikt*									RCA index (Overall average)
			2010	2011	2012	2013	2014	2015	2016	2017	2018	
HS01 Live animals												
1	'010190	Live mules and hinnies	5.8	0.2	0.0	0.0	1.3	420.8	240.8	0.0	0.0	74.3
HS02 Meat and edible meat offal												
2	'020210	Frozen bovine carcasses and half-carcasses	146.4	112.8	27.7	0.0	0.0	0.0	0.0	12.0	1.8	33.4
3	'020220	Frozen bovine cuts, with bone in (excluding carcasses and half-carcasses)	2.6	34.5	9.2	0.0	2.9	0.0	3.2	1.3	0.4	6.0
4	'020421	Fresh or chilled sheep carcasses and half-carcasses (excluding lambs)	14.8	0.0	0.0	0.0	0.0	0.0	0.6	0.8	2.5	2.1
5	'020441	Frozen sheep carcasses and half-carcasses (excluding lambs)	58.3	2.8	0.0	8.0	0.0	0.1	1.0	0.0	8.9	8.8
6	'020442	Frozen cuts of sheep, with bone in (excluding carcasses and half-carcasses)	8.2	0.1	0.6	3.6	0.0	0.0	0.2	7.5	9.6	3.3
7	'020450	Fresh, chilled or frozen meat of goats	402.0	11.7	19.9	0.0	0.0	1.0	1.5	0.0	21.2	50.8
8	'020500	Meat of horses, asses, mules or hinnies, fresh, chilled or frozen	200.4	58.7	36.0	70.7	34.6	67.4	125.9	302.0	364.9	140.1
9	'020690	Frozen edible offal of sheep, goats, horses, asses, mules and hinnies	43.3	3.2	9.0	21.9	3.0	1.8	1.2	3.2	25.9	12.5
HS05 Products of animal origin, not elsewhere specified or included												
10	'050400	Guts, bladders and stomachs of animals (other than fish), whole and pieces thereof, fresh, ...	11.8	9.8	9.4	11.0	5.3	7.3	5.2	3.6	4.2	7.5
11	'050690	Bones and horn-cores and their powder and waste, unworked, defatted, degelatinised or simply ...	26.8	5.3	6.0	0.0	0.1	0.2	3.3	2.6	11.2	6.2
HS16 Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates												
12	'160210	Homogenised prepared meat, offal or blood, put up for retail sale as infant food or for dietetic ...	0.0	0.0	0.0	0.0	0.0	0.3	5.1	66.4	90.0	18.0
13	'160250	Prepared or preserved meat or offal of bovine animals (excluding sausages and similar products, ...	0.4	0.1	0.1	0.0	0.2	0.8	1.9	5.1	30.5	4.3
14	'160290	Prepared or preserved meat, offal or blood (excluding meat or offal of poultry, swine and bovine ...	2.0	4.1	1.0	0.0	0.0	0.0	1.0	14.7	281.7	33.8
HS41 Raw hides and skins (other than furskins) and leather												
15	'410120	Whole raw hides and skins of bovine "incl. buffalo" or equine animals, whether or not dehaired, ...	14.9	7.1	6.9	13.8	7.8	6.8	39.9	5.2	0.0	11.4
16	'410190	Butts, bends, bellies and split raw hides and skins of bovine "incl. buffalo" or equine animals, ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.4	0.0	1.7
17	'410390	Raw hides and skins, fresh, or salted, dried, limed, pickled or otherwise preserved, whether ...	2.6	1.9	1.1	2.3	0.5	0.8	2.0	3.3	2.5	1.9
18	'410411	Full grains, unsplit and grain splits, in the wet state "incl. wet-blue", of hides and skins ...	13.8	11.4	5.9	6.9	6.8	10.1	13.3	10.8	11.0	10.0

19	'410419	Hides and skins of bovine "incl. buffalo" or equine animals, in the wet state "incl. wet-blue", ...	0.0	3.6	6.1	0.2	0.1	0.0	0.0	0.0	0.0	1.1
20	'410510	Skins of sheep or lambs, in the wet state "incl. wet-blue", tanned, without wool on, whether ...	166.5	175.7	132.6	154.7	105.6	158.2	28.2	40.6	39.1	111.2
21	'410621	Hides and skins of goats or kids, in the wet state "incl. wet-blue", tanned, without wool on, ...	353.7	155.9	202.4	259.3	311.7	407.3	180.0	174.9	160.5	245.1