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The Development Status and Prospect of Korean Livestock Industry

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Abstract: Since the beginning of the 2000's, the livestock industry of Korea has faced the need for paradigm shift from the existing quantitative growth to a sustainable qualitative growth, reflecting such changes in the domestic and international circumstances as the market liberation by FTA, the rise in international grain prices, the outbreak of a disease like the foot-and-mouth disease, the tightening of regulations on the livestock industry and the increasing demand for safe livestock products. For sustainable qualitative growth of the livestock industry, it is essential to support the upstream livestock industries such as feed industry, animal drug industry, livestock equipment and disease control. Therefore in this study, the current conditions of livestock and upstream industries of Korea are introduced focusing on the status of feed, cattle, swine and chicken industries and the expansion in overseas market on the basis of the plans to promote the development of future livestock industry in Republic of Korea (ROK).

Key words: Korean, livestock, industry, productivity, development status

INTRODUCTION

Korean livestock industry has changed rapidly and diversely for a shot period and it has been possible to make such a change by improving a great deal such an economic value as the employment effect increase of livestock industry through accomplishment of such quantitative results as the increase of production and the rise of self-sufficiency ratio. The livestock industry was just a sideline of Korean farmers early days. Since 1960's, however, it has faced a new era by launching animal feed factories out of the level of primitive processing (Jeong *et al*., 2011, structural change in production of food crops during the period from 1961-2010, 2011). In 1961, the government established a feed supply plan for the first time and around this time, Korea Mixed Feed Industry Association was established. Until the end of 1960's, however, the production of formula feed was only 100,000 tons/year. It was not until 1968 that due to the livestock-industry promotion policy, the development of Korean livestock industry welcomed a turning point. Afterwards in accordance with the results of the first economic development plan, the public investment in the field of livestock production started to actively develop as the structure of food consumption for the people gradually changed. As the production of poultry and pig farming industries expanded dramatically on the basis of enriched feed starting from late 1970's, enterprise-type livestock farms began to appear. From 1980's, the livestock industry of Korea grew rapidly and the production of domestic formula feed recorded an accomplishment of 10 million tons in 1989. The current total production of Korean livestock industry reaches 17 trillion and 471.4 billion won, accounting for 40.2% of the total agro-forestry production (Kim *et al*., 2012, 2011a, b; Kim, 2011). Considering that 6 livestock items belong to the list of top 10 agro-forestry items on the basis of the production, nobody denies the contribution of livestock industry to agro-forestry and national health. However, the livestock industry of Korea is now burdened by such disease problems as Foot-and-Mouth Disease (FMD), Avian Influenza (AI) and Porcine Epidemic Diarrhea (PED), manure treatment problem and livestock market opening problem such as FTA (Kim, 2009).

Moreover, due to limitation of the nation's total land area, the foreign dependence of raw feed still accounts for over 90% and the competition with the livestock foods imported from foreign countries due to conclusion of FTA remains a big threat. These phenomena have naturally been a catalyst for entering into foreign markets on the basis of the national-level R/D investment for R/D-based disease prevention, feed cost reduction and production of high-quality livestock products and of the domestically-accumulated saturated technology of domestic livestock enterprises.

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Therefore in this study, introduced is the current status of Korean livestock industry and its rear industry. The problems of Korean livestock industry are also diagnosed and the solutions thereof are briefly introduced.

MAIN BODY

The main body of this study is largely divided into 3 parts for description. The first part presents the contents of the current status of Korean livestock industry, the second one the situations for advance of livestock-related enterprises into Foreign countries and the last one briefly describes the problems of Korean livestock industry and the solutions thereof.

Current status of Korean livestock industry

Scale of livestock industry: Table 1 for the output and portion of Korean livestock industry for each year which represents the scale of Korean livestock industry, indicates that the total output of Korean livestock industry has increased by about 30% since 1980. It also shows that there no great changes are observed for native cattle/beef cattle but other scales for such areas as pig farming, chicken farming and duck farming increased remarkably. Especially, an annual increase of 8.0% from 8 trillion and 60 billion won in 2000 to 17 trillion and 500 billion won in 2010 is observed. The portion of livestock industry out of the agricultural output increased from 25.3% in 2000 to 41.9% in 2010. The output of livestock industry in 2011 was 15 trillion won, 14.2% decline from 2010 due to simultaneous outbreak of foot-and-mouth disease and avian influenza. In 2012, the output recovered to the level prior to outbreak of the diseases, 6.9% increase (16 trillion 20 billion won) from the previous year due to the increase in slaughtered heads. Currently, native/beef cattle accounts for 21.7% of the total output of livestock industry, pigs 33.4%, milk 12.6%, broilers 13.0%, eggs 8.5% and ducks 6.5%.

As shown in Table 2, the amount of income of livestock farms increased steadily during the period from 1995-2013. Especially, the income of livestock farms is higher than the average income of other produces.

The number of reared livestock heads: The number of livestock heads and the number of livestock farms are given in Table 3 and 4, respectively. The number of heads for all the livestock species more than tripled for the last 30+ years (Table 3) but it is possible to confirm that the number of livestock farms decreased remarkably (Table 4). This means that the size of each farm gets larger and large-scale businesses have appeared through merger, indicating that the livestock industry gradually develops into an enterprise type.

Production results of livestock products: As the rise of national income and the expansion of Western culture have increased the demand for livestock products, the

Table 1: Output and portion of South Korean livestock industry by year (Unit: a billion won)

Years	1995	2000	2008	2010	2011	2012
Agriculture (A)	26.342	31.968	38.470	41.677	41.358	44.300
Livestock (B)	5.916	8.082	13.593	17.471	14.991	16.023
Beef cattle (C)	1.776	1.879	3.548	4.863	3.053	3.473
Milk (D)	856.000	1.352	1.604	1.693	1.652	2.012
Pig (E)	1.407	2.372	4.085	5.323	4.545	5.348
Broiler (F)	773.000	821.000	1.429	2.146	2.186	2.090
Egg (G)	563.000	651.000	1.159	1.341	1.560	1.366
Duck (H)	154.000	474.000	1.154	1.306	1.157	1.045
Etc. (I)	432.000	533.000	614.000	799.000	839.000	688.000
B/A (%)	22.500	25.300	35.300	41.900	36.200	38.700
C/B (%)	29.800	23.200	26.100	27.800	20.400	21.700
D/B (%)	14.400	16.700	11.800	9.700	11.000	12.600
E/B (%)	23.600	29.300	30.100	30.500	30.300	33.400
F/B (%)	13.000	10.200	10.500	12.300	14.600	13.000
G/B (%)	9.400	8.100	8.500	7.700	10.400	8.500
H/B (%)	2.600	5.900	8.500	7.500	7.700	6.500
I/B (%)	7.200	6.600	4.500	4.600	5.600	4.300

Statistics Korea and Ministry of Agriculture, Food and Rural Affairs (MAFRA)

Table 2: The amount of income for South Korean livestock farms by year (Unit: 1,000 won)

Years	Livestock	Rice	Fruits	Vegetables	Special crop	Flowers	Dryfield	Average
1995	33.638	17.702	30.506	22.411	23.252	27.156	15.504	24.316
2000	29.816	19.598	28.609	19.960	32.572	19.588	18.920	23.072
2001	27.078	20.857	28.877	21.388	32.705	15.958	16.810	23.907
2002	31.512	20.225	29.735	23.497	33.294	26.037	16.574	24.475
2003	36.600	21.868	28.808	23.358	33.896	22.215	18.643	26.878
2004	42.706	22.127	32.681	25.146	35.247	27.551	28.104	29.001
2005	44.061	22.648	32.810	26.314	41.168	38.951	19.432	30.503
2006	48.245	25.753	33.467	26.279	49.319	34.378	18.208	32.303
2007	43.056	24.143	32.983	26.490	31.359	52.921	24.800	31.967
2008	46.398	23.318	30.419	24.164	41.633	35.874	20.022	30.523
2009	48.762	21.824	29.469	25.813	37.343	38.021	14.999	30.814
2010	42.179	20.628	34.991	28.625	39.127	27.408	27.252	32.121
2011	47.939	19.707	29.505	26.386	21.280	24.759	18.429	30.148
2012	46.660	19.609	32.261	26.922	24.064	32.231	16.374	28.303
2013	52.721	23.325	34.352	29.125	21.081	21.878	20.122	28.943

Statistics Korea

domestic production has also been on the rise. Lately, the radiation leak of Japan has created a replacement demand for marine products and has increased the per capita consumption of livestock products even more. The decrease of beef production in US has reduced the beef import a little. Thus, the domestic production of meat is expected to increase. Not only that but also the consumption of eggs and milk, complete foods is also expected to continue to maintain the growth rate in the future. Due to the efforts for expansion of production (example: payment of a normal price to the raw milk in excess of the base amount of raw milk after outbreak of FMD), the production of raw milk has increased gradually as the intention of farms to raise livestock has been on the rise (Table 5).

Production results of formula feed: As the number of livestock heads increases, the production results of feed also expand naturally. As shown in Table 6, the feed production in 2010 was >5 times as large as that in 1980. Especially, the feed production for all livestock species showed a rapid increase until 1995. In case of dairy farming, however, the growth trend slowed down due to introduction of the quota system for bulky feed and decrease in milk consumption. The production of formula feed for pig farming, poultry farming and fattening cattle has continued to maintain an increasing trend. Reflecting the effect of the increase in the number of reared livestock heads, this is considered to be caused by the increase in consumption of diverse livestock products due to the increase of national income and the diversity of favorite foods.

Per capita consumption of livestock products: As shown in Table 7, overall, the 2008 per capita consumption of meat in Korea showed a 6 fold increase over the 1970 one and especially the consumption of beef and pork increased a great deal. Especially, it is found that the amount of milk consumption continued to increase until 2010 and since then, it has showed a stagnant trend due to the change in dairy policy and the decrease in milk consumption.

Table 3: The status of livestock number by year in South Korea[1] (Unit: 1,000 heads)

Years	Korean native cattle/beef cattle	Dairy cattle	Pig	Chicken
1980	1.361	180	1.784	40.130
1995	2.594	553	6.461	85.800
2001	1.406	548	8.720	102.393
2008	2.430	446	9.087	119.784
2010	2.922	430	9.881	149.200
2011	2.950	404	8.171	149.511
2012	3.059	420	9.916	146.836
2013	2.918	424	9.912	151.337

[1]Statistics Korea, 2013

Table 4: The number of livestock farms by year in South Korea[1] (Unit: 1,000)

Years	Korean native cattle/beef cattle	Dairy cattle	Pig	Chicken[2]
1980	948	18.0	503.0	692.0
1995	519	24.0	46.0	203.0
2008	181	7.0	7.7	3.2
2010	172	6.3	7.3	3.6
2011	163	6.1	6.3	3.4
2012	147	6.0	6.0	3.1
2013	137	5.8	6.1	3.5

[1]Statistics Korea, 2013; [2]After 2008, the target of research is >3,000 breeding farms

Table 5: The record of supply and demand of livestock products

	Meat													
			Supply											
			Production				Import					The consumption of a head		
Years	Demand (1000t)	Values	Values	Beef	Pork	Chicken	Values	Beef	Pork	Chicken	kg	Beef	Pork	Chicken
2008	1.728	1.769	1.260	174	709	377	-	-	509	-	35.4	7.5	19.1	9.0
2009	1.809	1.808	1.329	198	722	409	-	-	479	-	36.8	8.1	19.1	9.6
2010	1.910	1.910	1.386	186	764	436	-	-	524	-	38.8	8.8	19.3	10.7
2011	2.036	2.036	1.246	216	574	456	790	289	370	131	40.6	10.2	19.0	11.4
2012	2.107	2.107	1.448	234	750	464	659	254	275	130	40.5	9.7	19.2	11.6

	Egg			Milk					
						Supply			
Years	Self-sufficiency (%)	Production and consumption A million	The consumption of a head No.	Demand (1000t)	Values	Production	Import	Carried forward	The consumption of a head (kg)
2008	71.7	10.838	224	3.035	3.131	2.139	885.000	96	61.3
2009	73.5	11.614	238	3.110	3.165	2.110	959.000	55	62.3
2010	72.6	11.582	236	3.249	3.263	2.073	1.135	13	64.9
2011	61.2	11.462	232	3.596	3.614	1.889	1.712	18	70.7
2012	70.3	12.090	242	3.452	3.544	2.110	1.414	92	67.2

Korea and Ministry of Agriculture, Food and Rural Affairs 2013 (MAFRA)

Current status for advance of domestic livestock industry into Foreign countries: Late 1970's while the production of poultry farming and pig farming industries dramatically expanding on the basis of enriched feed, enterprise-type livestock farms began to appear. Growing fast from 1980's, the domestic production of formula feed accomplished a production result of 10 million tons in 1989 but the number of reared livestock heads and the production of formula feed which increased fast from the middle and latter half of 1980's has not increased a great deal due to the limitation of domestic meat consumption early 1990's (Jeong *et al*., 2011; Ji *et al*., 2012). Under this situation, the number and production of not only feed industry but also livestock-related enterprises has continued to increase (Kim *et al*., 2011a, b). Such acceleration of the saturated condition for the domestic livestock-related market made livestock-related enterprises need a breakthrough. Since 1990's, Korean livestock industry has been swept away by the wave of economic globalization which expresses free trades by claiming the abolishment of trade barriers. Since then, Korean livestock industry has faced a new challenge that it should be equipped for survival with the international competitiveness to stand against the global market. Together with this as the market for formula feed and livestock-related products has expanded due to the increasing trend of meat consumption for countries in the region of Southeast Asia including China, the overseas expansion of each nation has come to the fore even more as a business strategy for preoccupancy of target countries (Latest statistical values for livestock industry of major countries 2013). Not only has such overseas expansion overcome the resources deficient in Korea by reducing the transportation cost, securing the market of sale of goods and abolishing customs barriers but also it has acted as a more attractive market due to smooth supply and demand of raw materials. For such reasons, the development of production bases for overseas market of Korean livestock-related enterprises has been active.

Starting with feed enterprises, Korean livestock industry began to enter into overseas expansion from the middle of 1990's (Lee, 2012). The enterprises which entered into overseas expansion as of 2013 are given Table 8 and 9. The number of enterprises which are now operating overseas factories is as follows: 14 enterprises

Table 6: The record of formula feed production in South Korea[1] (Unit: 1,000t)

				Cattle		
Years	Total	Chicken	Pig	Dairy	Beef	Etc.[2]
1980	3.462	1.872	769.000	514.000	306.000	1.000
1995	14.856	3.766	4.725	2.095	3.681	589.000
2008	16.323	4.285	5.306	1.370	4.164	1.195
2010	17.710	4.658	5.535	1.292	4.761	1.464
2011	16.815	4.748	4.482	1.240	4.792	1.553
2012	18.640	4.823	5.685	1.337	5.143	1.652
2013	19.084	4.790	6.136	1.332	5.213	1.465

[1]Ministry of Agriculture, Food and Rural Affairs (MAFRA), 2013; [2]Etc.: Including other livestock, fish and experimental animals

Table 7: The consumption of total meat, beef, pork, chicken, eggs and milk per head of the population in South Korea

Years	Total meat (kg)	Beef (kg)	Pork (kg)	Chicken (kg)	Egg (No.)	Milk (kg)
1970	5.2	1.2	2.6	1.4	77	1.6
1980	11.3	2.6	6.3	2.4	119	10.8
1990	19.9	4.1	11.8	4.0	167	42.8
1995	27.4	6.7	14.8	5.9	184	47.8
2005	32.1	6.6	17.8	7.5	220	62.7
2006	33.6	6.8	18.1	8.6	223	63.6
2007	35.4	7.6	19.2	8.6	226	63.0
2008	35.4	7.5	19.1	9.0	224	61.3
2010	38.8	8.8	19.3	10.7	236	64.2
2011	40.6	10.2	19.0	11.4	232	70.7
2012	40.5	9.7	19.2	11.6	242	67.2
2013	42.5	10.2	20.8	11.5	232	71.3

[1]Unit: kg (egg unit: number); [2]Statistics Korea, 2013

Table 8: Overseas expansion status of South Korea livestock industry by item (1992-2014)

Feed	Animal drug	Livestock housing	Dairy	Meat processing	Feed additive	Breeding
TS Co.	Pan island	Myongsung	Maeil	Ottogi	Pacific mart	Darby
Cargill Agri Purina	Woogene B&G	Samwoo-ENG	Wiihaehaeil agriculture and stockfarming	Chungbo trade	Easybio	Kumja
CJ Cheilchedang	Hanyou B&F	Songkang	Namyang dairy products	Jinju ham	Hanyou B&F	Sinchung bongyang Farming
Sunjin	Ewha pharmtek	Pighousing	Seou milk	Dongwon F&B	CJ cheilchedang	
Hanyou B&F	Dongbu parm hannong*				CTC bio	
Jeil feed					Feedbest*	
Woosung feed						
Hanil feed&food						
Coffedchina						
YJ fishery						
Daehan feed						
Dongaone						
Nonghyup						
Seoul feed						

The livestock industry is written in order of overseas expansion year; *Proposed business venture; Overseas investment information portal (search for overseas Korea enterprise), data collection from each association and companies

Table 9: Overseas expansion status of South Korea livestock industry (1992-2013) (Unit: No. of percentage)

Categories	Feed	Animal drug	Livestock housing	Dairy	Meat processing	Feed additive	Breeding	Total
Research companies (No. %)	48 (14.1)	71 (20.8)	52 (15.2)	19 (5.6)	34 (10.0)	95 (27.9)	22 (6.5)	341 (100.0)
Advance companies (No. %)	14 (36.8)	4 (10.5)	4 (10.5)	4 (10.5)	4 (10.5)	5 (13.2)	3 (7.9)	38 (100.0)
Advance number (No. %)	71 (61.7)	8 (7.0)	7 (6.1)	7 (6.1)	9 (7.8)	10 (8.7)	3 (2.6)	115 (100.0)
The first advance year	1992	1995	2000	1994	1996	1989	2004	
Major country	China, Indonesia	Vietnam, Southeast Asia	China, Thailand	China, Vietnam	China, USA	China, USA	China, Vietnam	

The proposed business number is excepted from advance companies and advance numbers; Overseas investment information portal (Search for overseas Korea enterprise), data collection from each association and company

(71 locations) from feed industry, 4 enterprises (8 locations) from animal drug industry, 4 enterprises (7 locations) from livestock housing industry, 4 enterprises (7 locations) from dairy industry, 4 enterprises (9 locations) from meat processing industry, 5 enterprises (10 locations) from feed additive industry and 3 enterprises (3 locations) from breeding industry. In the feed industry, since 1992 with TS Corporation and Cargill Agripurina as leaders such companies as CJ Cheilchedang, Sunjin, Hanil Feed, Woosung Feed have continued to get into overseas expansion and the amount of investment has also expanded. In the animal drug industry, since 2001 with Pan Island as a leader, Woogene B&G, Ewha Pharmtek and Dongbu Parm Hannong have lately jumped into the market of overseas expansion. In the livestock housing industry, since 2000 following Myoungsung, Samwoo Engineering, Songkang and lately Pighousing have got into overseas expansion. In the dairy industry, since 1994 with Maeil as a leader, namyang dairy products and seoul milk, the enterprises representing the dairy industry of Korea have got into overseas expansion. In the meat processing industry, since 2010, later than other industries following Jinju Ham, Dongwon F&B has entered into overseas expansion. And in the feed additive industry, since 1998 with Pacific Mart as a leader, Easybio, CTC Bio and CJ Cheilchedang have got into overseas expansion and lately feedbest is preparing for overseas expansion in 2014. In the breeding industry, since Darby Breeding and Sinchung Bongyang Farming entered into overseas expansion in 2004 and 2005, respectively mo breeding enterprises have now got into overseas expansion for over 10 years up to 2013.

Tasks to be solved by Korean livestock industry: Though, Korean livestock industry has continued to develop together with the high economic growth of Korea such phenomena as the scaling-up, aging and business closure of livestock farms have increased conspicuously. In addition, the industry is at the situation of intensifying changes in the conditions of livestock industry including the increase in distrust due to the increase of various regulations, climate change, manure and bad odor (FRTFS, 2009; Woo *et al*., 2011). The major problems faced by the livestock industry are sumarized as follows.

Threat from livestock diseases and increase in regulations: The damage of national and local economy due to outbreak of such a contagious disease as the foot-and-mouth disease and the increase of threats from livestock diseases due to diffusion of avian influenza have expanded and accordingly farming regulations have also increased. Thus, the necessity of establishing a thorough management system for prevention of livestock diseases has been highlighted.

Intensifying climate change: The phenomenon of moving a right place for growth of animal food crops due to the temperature rise of Korea affected by global warming has intensified and there have been concerns over the drop in the productivity and quality of livestock products due to the high temperature stress. Under these circumstances, the improvement of heat resistance has been required through species change of fodder crops and breeding improvement of individual livestock.

Increase in distrust of livestock industry: There has been a flood of public complaints of local residents due to such environmental problems as livestock manure and bad odor. Thus, we are at the point of necessitating such awareness-raising efforts as environmentally-friendly farming and landscape improvement.

Change in global environment: It is urgent to secure international competitiveness since market opening including Korea, US FTA and Korea, EU FTA has been accelerated and the conclusion of Korea, China FTA is also expected. The damage appears large since the decrease in the production of livestock industry due to Korea, US FTA is expected to amount to about 7 trillion and 300 billion won. The livestock industry is the area damaged most by Korea, EU FTA (effective on July 1, 2011) out of the entire agriculture and the production is predicted to decline on the average by 164.9 billion won per year. Especially, the promotion of Korea/China FTA conclusion may be a crisis to the livestock industry of Korea if it is well utilized, however, it may provide a win-win opportunity to each other. Lately, the meat production of China showed a 24 fold increase for the last 30 years while that of Korea was limited to about 2% of

China's meat production. For the same period, the production of pork which accounts for 64% of meat consumption in China showed a 4.5 fold increase. Milk production showed a 31 fold increase during the period from 1980-2010. Lately due to the melamine shock, the demand for consumption of sanitary and high-quality milk is rising rapidly. Therefore, the consumption of livestock products due to the economic growth and population increase of China is expected to continue to increase.

Intensifying unrest of international crop market: While, the demand for livestock products increases, the instability of feed prices due to unrest of international crop prices intensifies. It is judged that the decrease in crop production and the rise in international crop prices continue in connection to global climate change. Giant crop makers controls the international crop market. In case the price elasticity is inelastic, the crop market is called 'Shallow Market'. The annual production of animal feed is 16 million tons, over 90% out of which depends on the import, indicating that the self-supply rate of foods in Korea is the lowest among OECD countries (Woo *et al*., 2011). According to an OECD report, it is expected that the price of crops will rise by 40% within 10 years and due to future climate change, the production of crops will decrease and the price of crops will increase drastically. The major reason may be because the production of bio-fuel based on crops expands and the meat consumption increase due to the economic growth of developing countries (China, India). Thus, now than ever, it is necessary to make efforts to improve the productivity including development of natural feed resources and betterment of feed efficiency.

Changes in distribution and consumption environment: Korean consumers are very conscious of the safety of livestock products and the diversity of distribution structures and the reduction of distribution stages are expected which will activate the export through consumer preference to and demand expansion of Korean-type milk/meat products and globalization of Korean foods. Thus, it is urgent to not only secure the price competitiveness through simplified distribution structures but also produce high-quality safe livestock products.

Saturation of livestock-related enterprises: The number of reared livestock heads and the production of formula feed increased dramatically in Korea from the middle and latter half of 1980's but since early 1990's, the number of reared livestock heads has not increased a great deal due to the limitation in meat consumption of Korean people. Under these circumstances, however, the number and production of not only feed enterprises but also livestock-related enterprises have continued to increase (Lee, 2012; Woo *et al*., 2011). Such phenomenon has naturally accelerated the saturation of Korean livestock-related market and so livestock-related enterprises have needed a breakthrough in response to the problem. For such reasons, the development of production bases for overseas markets of Korean livestock-related enterprises has been active. However, due to lack of interest in policies for overseas expansion, lack of competence of enterprises for development of overseas expansion markets, focus on low-price sales to developing countries and lack of understanding of policies, laws, systems and culture, Korean livestock-related enterprises have difficulties in the local management. Since the livestock-related enterprises of Korea started to participate in the overseas expansion later than those of advanced countries and their market share is also lower, it is judged that they face various difficulties in the overseas expansion. Thus, it is important to identify the problems, solutions and strategies for overseas expansion of Korean livestock-related enterprises.

CONCLUSION

As mentioned above, Korean livestock industry has continued to develop at a fast pace together with a high economic growth rate. However, it is a reality that they face many problems. Under such circumstances, now is the time when the government, academia. And industry should make concerted efforts to solve present problems and introduce/execute plans for new breakthrough. Furthermore, the preparation of a win-win plan through the globalization of livestock farming by market opening, especially through the exchange of livestock farming in the region of Northeast Asia is also considered a good plan to prepare for future livestock farming. In this point of view, proposed are a few plans for solution of the problems faced by Korean livestock industry.

First, it is necessary to strengthen the competitiveness through improvement of the productivity. For this purpose, it is necessary to nurture a highly-productive livestock industry through improvement of high-capacity breeding stock, advanced specifications management for productivity improvement of reared livestock and development of advanced technology for control and prevention of livestock diseases. Second in order to respond to the expansion of market opening including simultaneous FTA conclusions (45 countries in 2013) and the rise of crop prices, it is necessary to have international competitiveness

through production of low-cost livestock products, improvement of breeding stock capacity, supply of high-capacity breeding stock, management of low-cost high-productivity specifications and operation of programs for elimination of wasting diseases and specific diseases in Korea. Third, it is necessary to develop resource-recycling livestock farming, promote the advancement of livestock environment and control the eco-system of livestock farming in order to develop a resource-recycling, environmentally-friendly and livestock-farming system for construction of conditions for eco-friendly sustainable livestock industry. Fourth, the distribution structure should be innovated and a consumer-oriented livestock food industry should be nurtured by the development of high-valued livestock processing technology and distribution/logistics technology. For this purpose, it is necessary to innovate the distribution/logistics structure for high-valued livestock foods and livestock products, construct a production/distribution system for low-carbon-emission livestock products, propose a futuristic high-tech livestock cluster model and expand the consumption of less favorite livestock products. Fifth, it is necessary to secure a new-growth engine for nurturing of a knowledge-based futuristic livestock industry by means of the development of futuristic livestock technology through fusion of agriculture, bio-technology and information technology. For this purpose, it is necessary to nurture bio-technology, ICT fusion technology and equine industry. Sixth, it is necessary to develop as a new-growth livestock industry the local specialization through development of the 6th industry type livestock model, the nurturing of small-sized luxury brands and the vitalization of regional experience-type livestock farming villages. Seventh, it is necessary to raise the competitiveness of livestock industry with a large-scale business model for nurturing of specialized large-scale enterprise-type livestock farms. Eighth for advance of livestock enterprises into foreign countries, it is urgent to nurture global talents who share the vision and value of livestock industry and it is important to not only diversify target countries for overseas expansion but also minimize trial and error through a thorough investigation of the local markets. Above all, it is prerequisite to develop differentiated competitive excellent products.

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