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**REPORTS OF THE NATIONAL ACADEMY OF SCIENCES
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A.K. Zhumabayev¹, T.P. Magay¹, Pohl Martin²¹Narxoz University, Almaty, Kazakhstan;²University of Tsukuba, Tsukuba, JapanSend2armani@gmail.com akku52@mail.ru pohl.martin.gf@u.tsukuba.ac.jp**THE SEARCH FOR THE EFFICIENT BUSINESS MODEL
FOR THE DAIRY SECTOR IN KAZAKHSTAN**

Abstract. The article is devoted to the analysis of the problems and perspectives of the organizational development of the dairy industry in the context of the problems of sharp growth of the productivity of labor and export of processed products set in the last message of the President to the people of Kazakhstan. The analysis of organizational innovations, modern business models used by the AIC, is carried out. The accumulated problems and the main development trends that have manifested itself in the dairy industry in Kazakhstan over the past two years have been analyzed. It is shown that there is a stable solvent demand for milk and dairy products in the present time, which is still largely satisfied by retail sales of its production by small producers. Prices have been steadily rising; accordingly, all enterprises of the dairy industry have prospects for the further development. However, no new business models are being implemented and are not even planned in the State Program for the Development of the Agro-Industrial Complex adopted last year. It is established that the development of dairy enterprises does not bring Kazakhstan closer to the solution of the task set in the President's message to increase labor productivity and the share of exports of processed products over the next five years. The results of a survey of the owners of milk processing enterprises and dairy farms of the East Kazakhstan, Zhambyl and South-Kazakhstan regions, which over the past two years have been actively involved in sectoral integration processes, are presented in the work. Evaluation of the willingness of the economic agents of the dairy industry to participate in new business models, network structures of small business integration in the value chains of large enterprises has shown the demand for the development of a qualitatively new information and analytical support for forecasting and planning the formation of new business models in the dairy industry in Kazakhstan.

Key words: dairy industry, business model, organizational innovation, network structure, integration process, economic agent, system integrator, information system.

Introduction. In the message of the President to the people of Kazakhstan dated January 10, 2018, the enterprises of the agro-industrial complex (AIC) had been given a task to increase labor productivity and export of processed products "at least 2.5 times over the next five years" [1].

This should be fully applied to the Kazakhstani livestock, in particular, to the dairy industry. The country has a significant natural potential for the development of a dairy herd of pasture and, accordingly, milk production, which, due to its high qualities, can experience the special demand in world markets.

However, the achievement of the goals set in the message is hampered by a number of problems. Among them, as noted in the State Program for the Development of the Agro-industrial Complex (2017), is insufficient supply of fodder, a low proportion of the breeding stock of animals, inadequate sowing areas for fodder and forage crops, irrational use of pasture lands, incomplete coverage of farm animals with the veterinary and preventive measures, [2].

The message outlines the main ways to solve the problems of the industry, which are presented as "smart technologies", including the transition to the modern business models that ensure an increase in the effectiveness of economic interaction and cooperation of all sectors in the value chain of agricultural enterprises [1].

According to O. Sabden, the goal of transition to the new business models is that "small business from an almost isolated subsystem of the national economy should turn into an organic part of a single production and the financial complex ... it is necessary to create conditions in which large business in the process of cluster formation massively involves small businesses in their activities" [3].

Methods

The aim of this research is to analyze the problems and prospects for the organizational development of the dairy industry in the context of sharp growth in labor productivity and export of processed products

Analysis of secondary (previously collected by other researchers) information, as well as statistical data, used in:

- considering modern business models of the agro-industrial complex - network structures for integrating small businesses into the value chains of large enterprises;
- analyzing the accumulated problems and the main development trends in the dairy industry in Kazakhstan over the past two years;

In order to assess the willingness of the economic agents of the dairy industry to participate in the new business models, we conducted a survey among the owners of the milk processing enterprises and dairy farms in East Kazakhstan, Zhambyl and South Kazakhstan regions, which over the last two years took an active part in integration processes in the sector.

Interviewing is a used method of collection of primary data in the study, including open questions, semi-structured and carried out by phone. 58 respondents agreed to participate in the interview. The main condition of participation was anonymity: the non-disclosure of personal data and commercial information in relation to the name of enterprises.

In the process of the analysis of collected data, the qualitative methods of analysis were used: the number of respondents is insufficient for applying mathematical statistics methods. However, according to authoritative experts, when using qualitative methods of analysis, the number of respondents may be small; statistical analysis of data, as a rule, is not carried out [4]; the results of qualitative analysis are easier to identify cause-effect relationships, compared with quantitative methods of analysis [5].

Literature review

1. The competitiveness of the processing enterprises of the agro-industrial complex at the end of the last century became critically dependent on their ability to accommodate the main business processes and management models on the basis of unified information channels with their suppliers and customers throughout the supply chain. Methods of solving this problem were considered in the concept of the Supply Chain Management (SCM) [6].

After decades, with the onset of the "grave new world: the end of globalization" [7] the use of the food resources by the economically developed countries as an instrument of geopolitical domination over other countries led to the global transformations in the world food market:

- the redistribution of the food flows between developed and developing countries;
- transition from the "the steadily low prices era" to the period of the high price volatility;
- the shift of the market from the limited demand model to the limited supply model [8].

In recent years, active use and further improvement of the methods of state protectionism have been observed throughout the world. The main trend of the world food market is tightening protectionist policies and ignoring the international trade rules and rules formed in the 20th century [9].

2. The term "cluster" has been used to refer to "a group of geographically neighboring interrelated companies and related organizations operating in a particular sphere, characterized by the common set of activities and mutually complementary" (for analyzing the degree of coherence of actions of independent economic entities, one of the methods of mathematical statistics, the so-called cluster analysis) [10].

The term of "cluster" as a "statistically established class of related elements in a certain aggregate of them" is still used in many fields of science - chemistry, physics, sociology, astronomy [11].

However, in the Economics of the 21st century,

- when household incomes are steadily declining for already two decades [12];
- when specialists have proved that several decades of continuous economic growth in the 30-70's of the twentieth century does not at reflect the general laws of the world development, but are merely "a consequence of the accidental coincidence of several historical events" [13];
- cluster analysis has largely lost its predictive power in assessing the coherence of the actions of independent economic entities [14,15].

A kind of "structural embodiment" of the SCM concept mentioned above was the formation of the qualitatively different business models that are described in the modern economic literature in terms of "networked integrated structures" and "integrated corporate entities" [16,17].

In fact, this is the same socio-economic phenomenon that has been once referred to as the "cluster". However, to describe their formation, very different mathematical methods are now used: the so-called multi-agent modeling [18,19,20]. Therefore, in this study, we will treat them as network structures for the integration (NSI) of enterprises in the AIC.

3. Most of the enterprises of the AIC, being formally independent and independent subjects of the market, nevertheless, are not self-sufficient and investment-attractive, unable to develop on the principles of self-sufficiency and self-financing, to participate fully and on an equal footing in inter-industry competition. The general trend in the development of the agro-industrial complex is the formation of NSI, which includes enterprises of all segments of the value chain "production (crop and livestock production) - processing (food industry) - distribution (wholesale and retail trade)" [9].

NSI is a set of economic agents carrying out economic activities, which, unlike a corporation, may not have a certain legal status and formalized organizational structure. This is a complex multi-level socio-economic system that has a distributed management system with an informal coordinating center (a system integrator) [16].

The mechanism of formation of NSI is described in studies on economic sociology [21,22]. The main structural component of the NSI is not a subsidiary company (as a holding company), but an economic agent that can have a variety of organizational forms and legal status. In other words, the NSI in principle does not have an organizational structure. This is an informal business community, "whose agents can directly interact with other organizations, integrate into their structure or, conversely, exit from them depending on the market situation" [23].

4. A distinctive feature of the NSI is that their existence in principle is impossible without a realistic strategy. The strategy induces independent economic entities to follow the rules of interaction established for the participants of the NSI by her informal management center - a meta-agent, a system integrator. If they consider that the strategy is not effective enough, they will simply leave it, they will find another, more efficient, system integrator.

The special difficulty of strategic planning for the meta-agent - the system integrator of the NSI is that the system of concepts describing business processes does not coincide with the system of concepts used in strategic planning [17].

The activity and structure of the NSI are described with the help of a qualitatively different terms: institutions, agents, formal and informal rules governing their interaction, and so on. Even the basic terms of the theory of strategic management of organizations are difficult to apply without additional qualifications and explanations. The "classical" methodology of strategic planning cannot be used by the system integrator at all.

Results

1. Average per capita milk consumption in Kazakhstan is 235 kg per year, while in European countries this figure is more than 400 kg per year [24].

The Kazakhstani dairy industry is not yet able even to provide the population of the country with a quality product.

The main producers of raw materials for the dairy industry in Kazakhstan are personal subsidiary farms with the number of one to five head of cattle. Currently, these farms provide, according to different estimates, 80 to 85% of marketable milk for industry. The number of cows in private households is 86% of the total number of livestock; 94-95% of dairy products produce 167 thousand peasants and 2 million 200 thousand subsidiary farms [25].

Significant dispersion of the dairy production on small-scale farms, with non-compliance with the ration of feeding and keeping animals, as well as equipment for storing and cooling milk, adversely affects milk yield and quality. From the average Kazakhstani cow, 2233 liters of milk are annually obtained, while in Russia the corresponding figure is 3,500, in Belarus 3000 liters, and Germany 6923, Canada 7962, and in the USA 9219 liters [24].

As noted in the "State program for the development of the agro-industrial complex of the Republic of Kazakhstan", the share of premium milk in Kazakhstan occupies only 2-3% of the production volume, a small portion is occupied by the first grade, the bulk belongs to second-class milk.

Milk produced in such farms falls on industrial processing in a very limited amount, because in most cases it is irrationally used for personal consumption and sold through unofficial channels. Only about a third of milk produced in Kazakhstan undergoes industrial processing. Milk processing enterprises provide only 27% of the country's consumption of packaged milk; while the production capacity for industrial milk processing is not used in full [2].

2. As the analysis has shown, over the past two years, integration processes among the small producers of marketable milk have intensified in the dairy industry (association in agricultural production cooperatives):

- in the Zhambyl region, about 700 small and subsidiary farms joined several dozen cooperatives;
- in the South-Kazakhstan region, by the forces of 20 cooperatives 33 module milk reception stations were opened;
- in the Kokchetav region, four milk processing enterprises receive marketable milk from 530 personal farmsteads, united in 15 cooperatives;
- 43 and 7 points of milk reception have been created in the Aktyubinsk region.

At the same time, construction of milk-processing farms in milk processing enterprises continues in Kazakhstan. Thus, in the Almaty region, Adal company found a solution to the problem of the shortage of raw milk, creating a production complex so-called "farm-plant". The livestock of this farm is more than 1000 milch cows; from 2014 to 2017, the average milk yield was increased from 5 thousand to 7.5 liters per year; total investment in this project amounted to about 5 billion tenge

However, such a large-scale investment can afford a few enterprises of the dairy industry. In the East Kazakhstan region, three dairy processing companies combine support for agricultural cooperatives (36 milk reception points for small producers) with the construction of their own dairy farms (they have already built 37)/

3. The most interesting, in our opinion, results of our survey of managers of milk processing enterprises and dairy farms are illustrated in the diagrams of Fig. 1-3

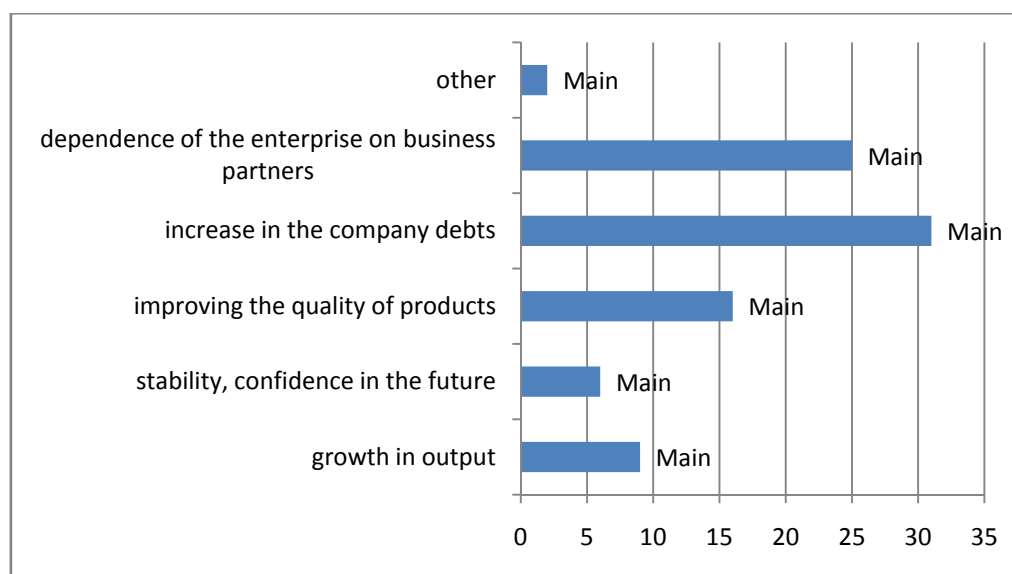


Figure 1 – The structure of answers to the question: What is the most significant result of participation in sectoral integration processes?

As we see, for the majority of respondents, the most significant changes are an increase in the company's debts and an increase in the company's dependence on business partners; in the prospects for growth in output and confidence in the future, most respondents are not at all sure about the answer.

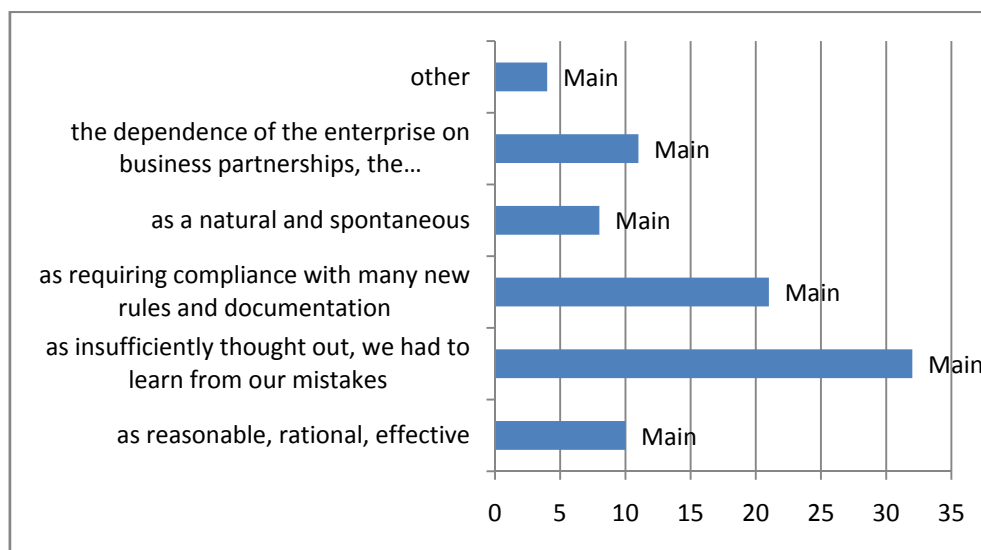


Figure 2 – The structure of the answers to the question: How do you assess the integration processes in which your enterprise took part?

The respondents' assessment of the practice of sectoral integration ("formation of clusters") is negative: the procedures are not sufficiently thought out, they had to learn from their mistakes; They are now required to comply with new rules and documentation.

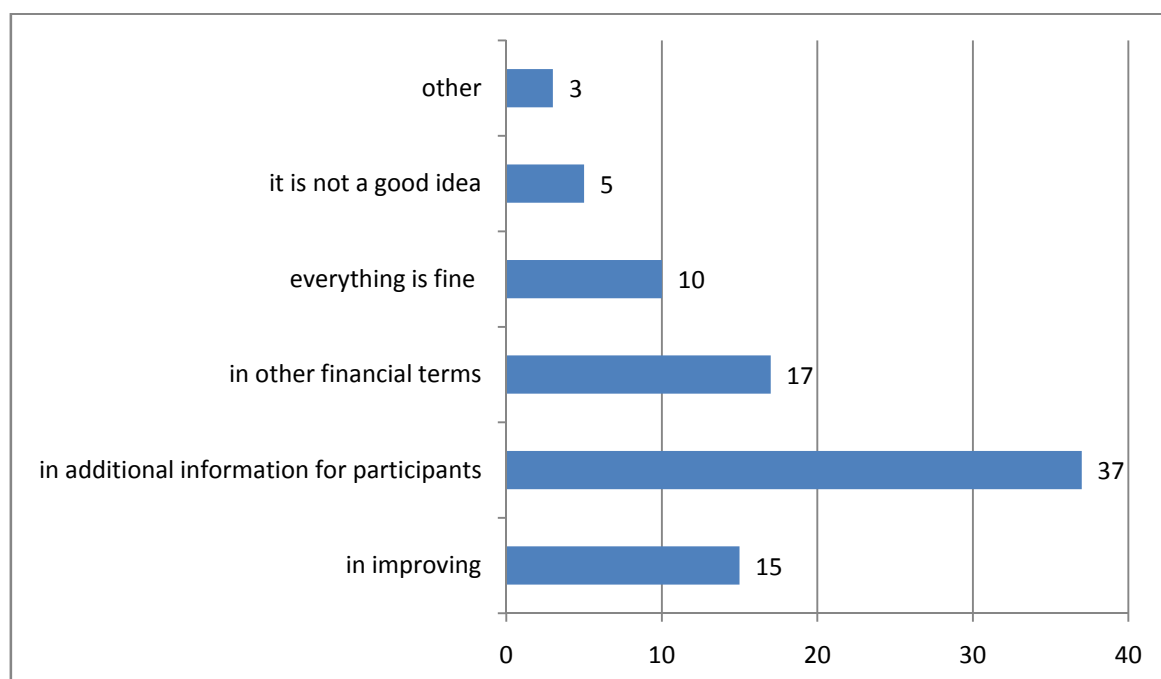


Figure 3 – The structure of answers to the question: In your opinion, are integration procedures ("formation of clusters") needed? (you can choose two answers)

As we have observed, in the opinion of the overwhelming majority of respondents, the main problem is not the terms of financing, but in the lack of information.

Discussion of findings

1. Up to the current date, the country has maintained a stable solvent demand for milk and dairy products, which is still largely satisfied by retail sales of its products by small producers. Prices are steadily growing [26]; accordingly, all enterprises of the dairy industry have prospects for development.

However, no new business models are being implemented, which is also not even planned in the State Program for the Development of the Agroindustrial Complex (2017) [2].

The development of dairy enterprises does not bring Kazakhstan one step closer to the solution of the task set in the President's message to increase labor productivity and the share of export of processed products grow over the next five years "at least 2.5 times" [1].

Obviously, this requires the development of the industry development strategy with a focus on organizational innovation.

2. The scientists of Kazakhstan have previously repeatedly developed organizational innovations for the dairy industry.

So, A.K. Zhumaev (2009) carried out mathematical modeling of the Kazakhstani dairy market and its' production and solved a number of tasks of multiply connected management of a large dairy company (that strategy for the development of the dairy industry, which in practice was implemented by Adal company) [27].

G.N. Nakipova, M.Zh. Kamenova and K.A. Akhmetova (2013) have analyzed integrated accounting of multidirectional trends in the production, distribution and consumption of dairy products, extrapolation and exponential smoothing methods were developed [28].

However, these studies do not answer the main question facing the dairy industry: how to improve the efficiency of the interaction of small/micro businesses and large processing enterprises in the context of the problems of sharp growth in labor productivity and export of processed products.

Conclusion

In our opinion, to address this issue as a promising new business model of the dairy industry should adopt the NSI.

As a result of our survey among the participants of the milk processing enterprises and dairy farms, we were convinced by the demand for the development of a qualitatively new information and analytical support for forecasting and planning the formation of NSI enterprises in the dairy industry.

The information system, without which, in principle, it is impossible to form the network structures of economic agents, should provide the following:

- exchange of information between all active and potential NSI participants;
- the unity of formal and informal rules of doing business in the NSI;
- analytical support for making timely and adequate managerial decisions by the system integrator/meta-agent.

To solve the first two tasks, it is quite enough to create an Internet server, which publishes all the working materials with detailed headings available to network participants; electronic mailing lists (based on e-mail and Internet forums) on specific topics of the project and sub-projects, as well as an information portal that will cover the activities of network participants.

In order to solve the third task, analytical support of the system integrator/meta-agent acceptance of timely and adequate managerial decisions, it is necessary to develop a special information system

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ҚАЗАҚСТАННЫҢ СҮТ ӨНЕРКӘСІБІ ТИІМДІ БИЗНЕС ҮЛГІСІН ІЗДЕУДЕ

Аннотация. Бұл мақала Елбасының Қазақстан халқына арнаған. Жолдауында белгіленген еңбек өнімділігінің күрт өсуі және өңделген өнімдерді экспорттау мәселелері бойынша сүт өнеркәсібінің ұйымдық дамуының проблемалары мен перспективаларын талдауға арналған. Ұйымдастырушылық инновацияларға, яғни АӨК қолданатын заманауи бизнес-үлгілерге талдау жүргізілді.

Соңғы екі жылда Қазақстанның сүт өнеркәсібінде көрініс тауып, жинақталған проблемалар және негізгі даму тенденциялары қарастырылды. Бүгінгі таңда сүт және сүт өнімдері тұрақты төлемге қабілетті сұранысқа ие екендігі айқын көрсетілді, бұл сұраныстың басым бөлігі әлі күнге дейін шағын өндірушілердің өз өнімдерінің бөлшек саудалары арқылы қанағаттандырылуда.

Бағалар тұрақты түрде өсуде; тиісінше, сүт өнеркәсібіндегі барлық кәсіпорындар даму перспективаларына ие. Дегенмен, ешқандай жаңа бизнес үлгілері іске асырылмауда - бұл тіпті өткен жылы қабылданған Агроөнеркәсіптік кешенді дамытудың Мемлекеттік бағдарламасында да жоспарланбаған. Сүт кәсіпорындарының дамуы әлі де болса Қазақстан Президентінің Жолдауында қойылған алдағы бес жылда еңбек өнімділігін арттыру және өңделген өнімдердің экспортының үлесін ұлғайтуға бағытталған міндеттерді орындауға бір қадам болса да жасамайтындығы анықталды.

Соңғы екі жылда өнеркәсіптік интеграциялық үдерістерде белсене атсалысқан Шығыс Қазақстан, Жамбыл және Оңтүстік Қазақстан облыстарындағы сүт өндіруші кәсіпорындар мен сүт фермаларының басшыларынан алынған сауалнама нәтижелері ұсынылуда. Сүт өнеркәсібінің экономикалық агенттерінің жаңа бизнес үлгіде, шағын бизнестердің ірі кәсіпорындардың өндіру-өткізу тізбектеріне бірігудегі желілік құрылымда қатысуға дайындығын бағалау жаңа сапалы ақпараттық және болжау аналитикалық қолдауды дамыту қажеттілігін және Қазақстанның сүт өнеркәсібі үшін жаңа бизнес үлгілерін қалыптастыруды жоспарлау қажеттілігін айқын көрсетті.

Кілт сөздер: сүт өнеркәсібі, бизнес үлгі, ұйымдастырушылық инновация, желілік құрылым, интеграциялық процесс, экономикалық агент, жүйелік интегратор, ақпараттық жүйе

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МОЛОЧНАЯ ОТРАСЛЬ КАЗАХСТАНА В ПОИСКЕ ЭФФЕКТИВНОЙ БИЗНЕС МОДЕЛИ

Аннотация. Статья посвящена анализу проблем и перспектив организационного развития молочной отрасли в контексте задач резкого роста производительности труда и экспорта переработанной продукции, поставленных в последнем Послании Президента народу Казахстана. Проведён анализ организационных инноваций – современных бизнес моделей, используемых АПК.

Рассмотрены накопившиеся проблемы и основные тенденции развития, проявившиеся в молочной отрасли Казахстана за последние два года. Показано, что до настоящего времени в республике сохраняется стабильный платёжеспособный спрос на молоко и молочные продукты, который в значительной части всё ещё удовлетворяется за счёт розничной продажи своей продукции мелкими производителями. Цены устойчиво растут; соответственно, у всех предприятий молочной отрасли есть перспективы для развития.

Однако никаких новых бизнес моделей не внедряется – и это даже не планируется в принятой в прошлом году Государственной программе развития агропромышленного комплекса. Установлено, что развитие предприятий молочной отрасли пока ни на шаг не приближает Казахстан к решению поставленной в Послании Президента задачи увеличения за ближайшие пять лет производительности труда и доли экспорта переработанной продукции.

Представлены результаты опроса руководителей молокоперерабатывающих предприятий и молочно-товарных ферм Восточно-Казахстанской, Жамбылской и Южно-Казахстанской областей, которые за последние два года активно участвовали в отраслевых интеграционных процессах.

Оценка готовности экономических агентов молочной отрасли к участию в новых бизнес моделях, сетевых структурах интеграции малого бизнеса в производственно-сбытовые цепочки крупных предприятий показала востребованность разработки качественно нового информационно-аналитического обеспечения прогнозирования и планирования формирования новых бизнес моделей в молочной отрасли Казахстана.

Ключевые слова: молочная отрасль, бизнес модель, организационная инновация, сетевая структура, интеграционный процесс, экономический агент, системный интегратор, информационная система

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