

Improvement of the Resource Potential Management in Socially Important Enterprises of Agricultural Sector

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Abstract: This study deals with the current scientific aspects of the economic conditions and resource potential management in the enterprises. The methods of assessing effectiveness in industrial enterprises resource potential usage are also brought up in this study. This study reveals the key areas to improve the management of the enterprise resource potential in grain procurement.

Key words: Resource potential, socially important grain procurement enterprises, quality management, efficiency, Russia

INTRODUCTION

The efficiency of grain procurement enterprises is determined, above all, by the level of available resources, that create performance by the accumulated potential and framework conditions for capacity intensification on the technical and technological level.

The peculiarity of resource potential system management in Russian economy enterprises is that the update of technical and technological potential is happening in terms of economic sanctions, the need for import substitutions and the limited financial capacity of organizations.

For socially important sectors it is necessary to make development and management decisions to ensure the effective use of resource potential, including determining the level of country food security.

The scientific aspects of the study were based on the investigation, critical analysis and reconsideration of theoretical and methodological development of local and foreign scientists.

The goal of this study is to develop theoretical and methodological positions and practical recommendations aimed at improving the resource potential management of socially important agricultural enterprises.

In accordance with the intended goal the following tasks were formulated and accomplished: theoretical aspects of resource potential management in the enterprises, including the listed resource potential structure and strategic generalized scheme; introducing methods to evaluate the effectiveness of the enterprise resource potential and assess the effectiveness of the research object resource potential management with the

help of indicators that characterize the quantitative and qualitative aspects of its use; recommendations on improving the resource potential management of the enterprise in grain procurement.

The grain procurement enterprises of Russia were chosen as a study object. More detailed studies were conducted on the example of one of the elevators in Voronezh region.

Subject of the study is management matters arising during the resource potential management of industrial enterprises.

Theoretical and methodological basis of the study were fundamental and applicative developments devoted to the problem of effective resource potential management with the help of modern methods and tools.

Information base was formed on the basis of materials from Statistics Federal Services, official data from the Ministry of Agriculture, web sites, accounting and financial statements of the studied companies, data calculated and collected by the authors in person.

The following scientific methods of obtaining economical knowledge were used in this study: dialectical, logical, systematic and situational approach, advanced analytical and graphical methods. The accuracy and validity of the findings and recommendations are ensured by the used methodological base.

Scientific novelty of the study consists in theoretical and practical aspects of resource potential management in agricultural enterprises.

Practical significance of the study consists in adapting methods and management tools to the resource potential of socially important enterprises in agricultural sector. The practical value is applied to the developments

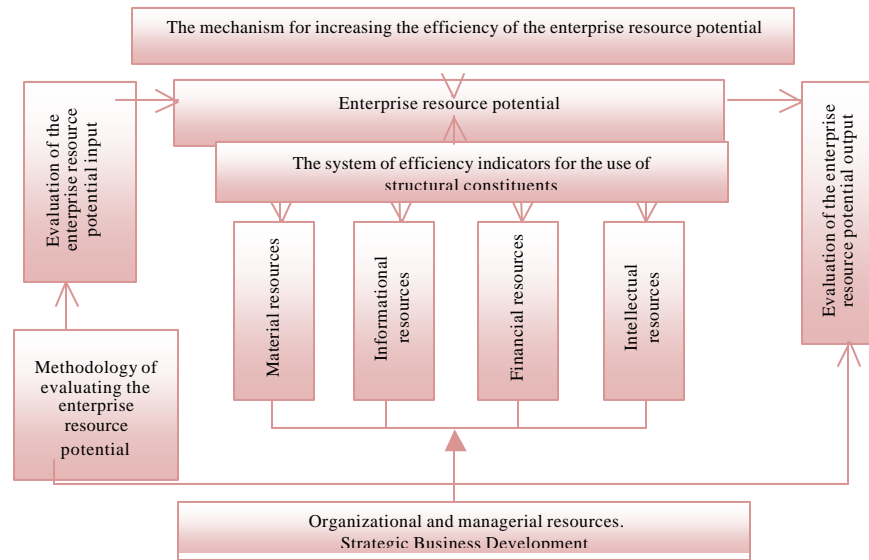


Fig. 1: Structure of the enterprise resource potential

that contain the following issues: refined structure of the enterprise resource potential, generalized methods for assessing the effectiveness of resource potential usage in enterprise; key activities to increase the efficiency of the resource potential for social important enterprises in Russia; quality control stages and process map in grain procurement enterprises.

Testing and implementation of the study results. Theoretical propositions and practical results were reported at the international and inter-university conferences. The recommendations are introduced into the practical activities of regional companies.

Theoretical aspects of resource potential in the enterprises: One of the criteria that determine functioning of grain procurement enterprises in the conditions of common economic space is implementation of the expanded reproduction on the basis of effective resource potential usage in organizations, that would ensure the competitiveness of agricultural enterprises. The resource potential of organizations should be seen as a complex, continually reproducing system providing not only their own reproduction but also socially oriented agricultural production in order to meet the needs of the population in food and the need of raw materials in agriculture, in the conditions of necessity for solving the food security issues.

Today, there are a lot of publications related to the study of the enterprise resource potential. On the basis of critical analysis, it can be stated that the resource potential is a characteristic of the system status, scientific category which simultaneously captures the essence of theoretical foundations, the set of real processes and phenomena. In general, under the resource

potential of an economic entity we should understand its ability to effectively implement functional business tasks at the most efficient use of the available economic resources (Altukhov, 2014).

The resource potential of an enterprise structure can be interpreted as a collection of different resources required for maintaining the development in risk forming conditions of external and internal environment. The model of commercial resource potential in organizations is shown in Fig. 1. The main structural components of the resource potential are the elements that have different functional purposes: material, informational, financial, intellectual and other resources (Rizhuk, 2012).

The most important distinguishing feature of the “resource potential” category is as follows: the resource potential is not just a collection of resources but the system of resources used in an integrated manner, i.e., every resource is complementarity. The resource potential provides interchangeability of resources which creates conditions of variability and the use of different types of elements to achieve an eventual result. The structure of the resource potential includes not only the resources intended for consumption in the period under consideration but also their reserves.

The generalized scheme of an external and internal environment influence factors on the enterprise resource potential are shown in Fig. 2. The overall economic strategy in the form of separate blocks combines functional strategies, types of potentials, target subsystems, potential growth factors and management subsystems (Popova and Ponomareva, 2013).

In our opinion, to achieve the enterprise resource potential objectives, the resources have to be not just a mechanical set of individual types but a system of

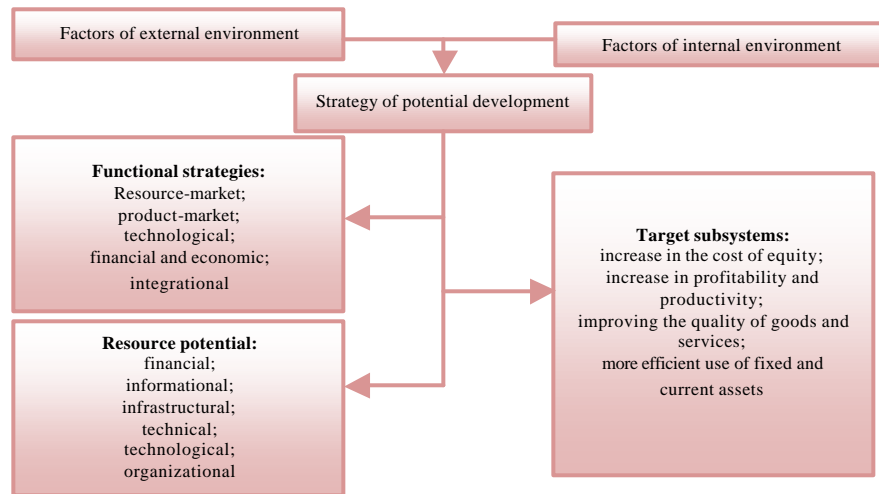


Fig. 2: Generalized scheme of strategic approach to the formation of the enterprise resource potential

interconnected optimal quantitative and qualitative resources. It is necessary to effectively manage the process of the resource potential creation, renovation, development and utilization. In this regard, management of the resource potential represents the activity of grain procurement enterprises on managing the systems of all components in order to implement and develop it for more efficient use. To ensure the effectiveness of agro-business functioning, it is necessary to form the modern resource management systems to achieve certain objectives of the managing subject (Popova and Ponomareva, 2013).

The set of resource potential management principles includes the principles of systematic resource management, the formation of the resource potential "core", order of the resource potential structure, providing competitive advantages, efficient use of resources, synergistic effect and stabilization of various elements, consistency with the development of agro-business strategy (Shatokhina *et al.*, 2015).

In this regard, the control mechanism of the resource potential for industrial enterprises can be defined as multi-functional and multi-component system consisting of a set of interrelated elements that are exposed to external and internal factors forming a certain integrity (Shatokhina *et al.*, 2015). Issues of resource potential formation and determination of the optimal resource proportions are included in the strategic management competence and can be successfully solved only in a package plan.

MATERIALS AND METHODS

Efficiency evaluation methods of the resource potential:
As a result of the study and critical analysis of the

existing modern effectiveness evaluation methods for resource potential usage, applied by scientists and economists in literature, we suggest grouping methods that can be applied by enterprises in economic activity (Table 1).

Analysis of the evaluation methods once again confirms the important role of the resource potential as a basis for organization economic activities. The study of complex enterprise resource potential performances is performed in order to determine adverse factors and causes that reduce the efficiency of business and identify reserves for the increase of efficiency. Thus, estimation of the efficiency of resource potential usage on the basis of a single indicator is not able to characterize it fully, so you need to use multiple evaluation concepts and determine the efficiency of resource potential usage (Rizhuk, 2012).

Evaluation of resource potential management effectiveness is made on an example of the study object with the use of indicator system that characterize quantitative and qualitative aspects of usage. Table 2 shows the evaluation results of generalized provision indicators of basic production assets.

Generalized indicators of capital-labor ratio and technical equipment production in 2012-2014 have demonstrated a positive trend. Technical equipment did not achieve the necessary balance. The average annual value of an active part of industrial-production assets was growing faster than reduction of the annual output. Table 3 shows the results of effectiveness and usage evaluation of the basic production assets.

All the effective use indicators in an active part of the industrial and production assets showed a negative

Table 1: Effectiveness evaluation methods for enterprise resource potential

Method type	Group characteristic	Indicators characterizing the type of method	Economic rationale of indicators
Cost	The methods are based on a single indicator that include the costs of the enterprise	Sales efficiency, cost, profitability of outlay	The effective use indicators for resource potential on the basis of successful turnover and profit indicators
Resource	The methods are based on the indicator that include a turnover of retail trade and profit	Resource productivity,	
Effective	Methods for resource potential evaluation on the composition of the main economic indicators	Generalized indicator resource potential effective use, generalized indicator of production efficiency effectiveness indicator of a specific resource potential	Quantitative evaluation indicators of the enterprise activity
Complex-system	Methods for determining the effectiveness of various resource potential types	Generalized dynamics indicator of the enterprise resource potential effective use; Indicator of the enterprise resource potential economic efficiency composite index of the enterprise resource potential performance	Examine the activities of an enterprise deeper and in more detail, that makes the use of the existing resources more effective and identify the reserves

Table 2: Evaluation of generalized provision indicators of basic production assets in 2012-2014

Indicators	2012 r	2013 r	2014 r	Fluctuation (+, -)		Growth rate (%)	
				2013-2012	2014-2013	2013-2012	2014-2013
The volume of output production in comparable prices (Thous. rub)	74260.00	70 976.00	64914.00	-3 284.00	-6 062.00	95.58	91.46
The average annual value of basic production assets (Thous. rub)	55181.00	57709.50	56786.50	2 529.00	-923.00	104.58	98.40
The average annual value in active part of the industrial and production assets (Thous. rub)	38627.00	42128.00	39183.00	3501.00	-2945.00	109.06	93.01
Workforce size person	115.00	115.00	114.00	0.00	-1.00	100.00	99.13
Workforce productivity. thous Rub./Person.	442.02	422.48	388.71	-19.54	-33.77	95.58	92.01
Capital-labor ratio. thous Rub./Person.	479.83	501.82	498.13	21.99	-3.69	104.58	99.26
Technical equipment production Thous. rub./Person	335.89	366.33	343.71	30.44	-22.62	109.06	93.82

Table 3: The results of efficiency and intensity calculation of the basic production assets

Indicator	2012 r	2013 r	2014 r	Fluctuation (+, -)		Growth rate (%)	
				2013-2012	2014-2013	2013-2012	2014-2013
The volume of output production in comparable prices (Thous. rub)	74260.00	70 976.00	64914.00	0.96	0.91	-4.42	-8.54
The average annual value of basic production assets (Thous. rub)	55181.00	57709.50	56786.50	1.05	0.98	4.58	-1.60
The average annual value in active part of industrial and production. assets (Thous. rub)	38627.00	42128.00	39183.00	1.09	0.93	9.06	-6.99
Profit before tax (Thous. rub)	-816.00	-7722.00	-2552.00	9.46	0.33	846.32	-66.95
Return on assets of an active part Rub./Rub.	1.92	1.68	1.66	0.88	0.98	-12.37	-1.67
Capitalization ratio of an active part (Rub./Rub.)	0.52	0.59	0.60	1.14	1.02	14.11	1.70
Return on assets of an active part (%)	-2.11	-18.33	-6.51	8.68	0.36	767.68	-64.47
Relative savings (overrun) of an active part of basic production assets. thousand. RUB	4968.77	4005.92	-	-	-	-	-
Extensive use factor of an active part of assets	-2.05	0.82	-	-	-	-	-
Impact interest of the extensive use for an active part of basic production assets in the commodity output growth (%)	-204.95	81.85	-	-	-	-	-
Index of heavy use	-0.49	1.22	-	-	-	-	-
Impact of intensive use of an active part of basic production assets on the increase of sales profit (%)	304.95	18.15	-	-	-	-	-

Table 4: The factorial calculation results of the output dependence on the volume and nature of material costs

Indicators	Years			Fluctuation (+, -)	
	2012	2013	2014	2013-2012	2014-2013
Output (Thous. rub)	74260.00	70 976.00	64 914.00	-3 284.00	-6 062.00
Material costs (Thous. rub)	36449.00	33548.00	40548.00	-2 901.00	7 000.00
Incl. Raw material and materials	23813.00	17595.00	20234.00	-6 218.00	2 639.00
Gas	6563.00	9260.00	12751.00	2 697.00	3 491.00
Energy	6073.00	6693.00	7563.00	620.00	870.00
Material output (Rub.)	2.04	2.12	1.60	0.08	-0.51
Materials consumption. Rub Total	0.49	0.47	0.62	-0.02	0.15
Including				0.00	0.00
Raw volume. Rub.	0.32	0.25	0.31	-0.07	0.06
Gas volume. Rub.	0.09	0.13	0.20	0.04	0.07
Energy volume. Rub.	0.08	0.09	0.12	0.01	0.02
Factor impact in the model $N^T = M/Y^M$ on fluctuation of the output volume					
Impact of total material costs	-	-	-	-5910.40	14809.59
Impact of material consumption	-	-	-	2626.40	-20871.59
Balance of deviations	-	-	-	-3284.00	-6062.00
Impact of the second order factors on fluctuation of the output volume					
Raw volume	-	-	-	10522.83	-8762.57
Gas volume	-	-	-	-6086.10	-9059.00
Energy volume	-	-	-	-1810.34	-3050.02
Balance of deviations	-	-	-	2626.40	-20871.59

Table 5: Indicators of working capital efficiency for 2012-2014

Indicators	Years			Fluctuation (+, -)		Growth rate (%)	
	2012	2013	2014	2013-2012	2014-2013	2013-2012	2014-2013
Working capital turnover ratio	0.61	0.54	0.48	-0.08	-0.06	87.51	89.28
Working capital to current assets ratio	0.36	0.17	0.26	-0.19	0.09	47.22	152.94
Sales to working capital ratio	1.21	1.08	0.93	-0.13	-0.16	89.44	85.52
Inventory turnover ratio	9.49	7.55	8.58	-1.94	1.03	79.54	113.65
Receivable turnover ratio	1.60	1.46	1.25	-0.14	-0.20	91.18	85.96
Turnover rate of payables ratio	1.60	1.46	4.44	-0.14	2.98	91.18	304.23

The factorial calculation results of the output dependence on the volume and nature of the material costs are presented in Table 4.

In 2013, the reduction in output production was due to the negative influence of total material costs; Reduction of raw volume boosted production by saving resources; Rising fuel costs and the purchase of energy carriers led to the increase in consumption for per ruble of products.

In 2014, the cost reduction of output production at 6062 Thous. rub. was caused by the negative impact of materials consumption which resulted in the effective rate decreased by 20,871.59 Thous. rub. One of evaluation indicators for the effectiveness of an enterprise is business activity (Table 5) (Popova and Ponomareva, 2013).

The calculation results indicated deterioration of the enterprise business activity as a result of resource potential deficiency which led to significant profitability reduction.

To change this situation, the authors developed recommendations aimed at improving management of the studied enterprise resource potential.

RESULTS AND DISCUSSION

Management improvement of the resource potential in grain procurement enterprises: The study found that today to improve the management of the resource potential in socially important agricultural enterprises we need to strengthen the relationships on favorable terms for all participants of the grain market infrastructure (Klimova, 2012).

To solve the problems of the resource potential efficiency we need to undertake the following key actions:

- Perform a science-based definition of the grain quality coming from the producers with the actual parameters
- Introduce grain samplers and production-technological laboratories with modern automation equipment to ensure the accuracy in determining the grain quality parameters
- Establish science-based indicators of treatment, drying and storing grain costs, generating revenues not only for the cereal products enterprises but also for the producers

Table 6: Average wheat quality (grade 4) parameters accepted for storing by the object of study

Quality indicators	2012	2013	2014
Natural weight (g L ⁻¹)	780.00	780.00	780.00
Humidity (%)	14.20	14.60	14.80
Raw gluten.(%)	21.80	23.00	23.00
Quality of raw gluten in units	70.00	60.00	60.00
Black dockage total (%)	3.40	5.20	3.90
Incl. organic	1.72	3.00	2.00
Spoiled kernels	1.68	2.20	1.90
Grain dockage total (%)	3.88	5.30	5.06
Incl. broken kernels	2.52	2.60	2.64
Eaten kernels	0.06	0.06	0.06
Shriveled kernels	-	0.44	0.24
Sprouted kernels	0.72	0.60	1.00
Damaged kernels	1.84	1.60	1.12
The content of grains damaged by chinch (%)	2.00	2.00	2.00

- Develop and apply in practice the system of expansionary measures aimed at increasing motivation for selling grain to subcomplex cereal products enterprises
- Increase scientific and technical level of cereal products enterprises production by automating main technological operations during harvesting, as well as the computerization of calculations for accounting and registering the delivered grain
- Develop the infrastructure of production enterprises through the establishment of truck fleet for the transport of grain with the computerized information systems that provide complete information on grain demand, supply, price for different types of grain quality and other necessary information (Stryapchikh *et al.*, 2012)

As it is known, cereal production enterprises store and recycle expensive and very valuable raw materials such as grain and working with grain is impossible without an established monitoring and accounting system. The monitoring system covers all material flows in an enterprise, from the supply of raw materials to finished product release. At the same time characteristics of material flows as they move significantly change in the enterprise.

When storing, conditioning and wasting grain there are processes related to biological, chemical and mechanical changes, accompanied by the losses, these factors could be considered by the industry norms or not affecting the total cost of material resources (Dracheva, 2013).

Grain quality and products control at all stages of enterprise production is carried out by the laboratories equipped with complex devices that meet all relevant metrological requirements. The competent equipment of laboratory is not only of practical importance but rather complex scientific and technical problem, since the choice of the optimal set of equipment is a multifactorial problem, there are lot of ways to solve it (Bogomolova *et al.*, 2015).

The optimal set of laboratory equipment should be formed for a specific task with the maximum consideration of technical, organizational and economic production requirements. First of all, you need a clear idea of the system ultimate goal for raw material quality control and production, also you need to know the technology of production, volume, terms, frequency of sampling and range of measurable indicators, the operating conditions of the equipment, evaluate the possibility of the enterprise to provide energy carriers, water and chemical agents for the laboratory. A significant influence on the choice of laboratory equipment is made by the factors associated with qualified professionals and potential economic effect of the introduced equipment.

Let us consider the average wheat quality (grade 4) parameters accepted for storing as the object of study (Table 6). During the study period the main grain quality indicators, that were accepted for storage and conditioning have gone worse. The samples in the laboratory showed the increased number of eaten, shriveled and sprouted kernels which in turn causes a decrease in the value of such materials. In this situation, the enterprise has two options: bring low-quality grain to the conditioned state which implies a growth of costs for grain cleaning, drying and conditioning which is known to be unprofitable. The other option is to sell the unconditioned grain as the forage crop which significantly reduces its cost (Shatokhina *et al.*, 2015).

The reasons for the sharp quality decline of the stored grain are the following: weakening of responsibility for the conduction of sanitary and preventive measures to bring the grain in a persistent storage condition; absence of state control at the domestic market during grain movement and storage; ineffective disinfection, often carried out by the enterprises themselves without the involvement of specialists; old material and technical facilities of the storage (Petrichenko, 2015).

Table 7: Control process map

Indicators	Frequency	Sampling	Assessment reference on control method
Grain Humidity	2 times per shift	At several locations of each bulk-grain	GOST 13586.5-93 "Grain. Method of moisture determination"
Relative air humidity	1 time per shift	In different parts of the grain storage	Hygienic requirements for the microclimate of industrial premises. Sanitary rules and norms SanPiN 2.2.4.548-96;
Air temperature in the grain storage	1 time per shift	In different parts of the grain storage	Hygienic requirements for the microclimate of industrial premises. Sanitary rules and norms SanPiN 2.2.4.548-96;

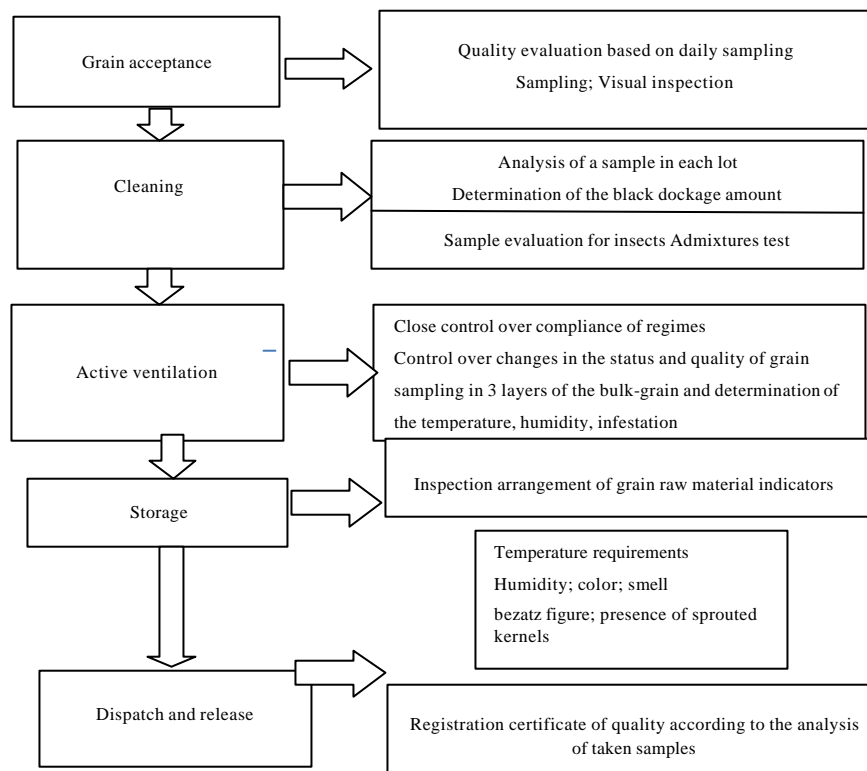


Fig. 3: Quality control Steps on grain procurement enterprises

There are various natural biochemical processes in the grain mass during grain storage. Lack of sufficient control over the grain condition and activities that prevent harmful effects of these processes leads to decrease of the quality. In order to prevent negative effects and reduce the grain loss risks, leading to degradation of the resource potential usage, we offered the following quality assurance steps to the grain procurement enterprises (Fig. 3).

Basing on the study we developed the method of monitoring these parameters to control the quality of grain during storage (Table 7).

Results of the analysis are largely dependent on the correctness of sampling. Compilation of the combined and medium samples of cereal products begins from selection of the point samples. Each point sample is inspected and

compared according to the appearance and organoleptic characteristics. Upon establishing the uniformity, the samples are mixed to create a combined sample. Medium sample is taken from the combined sample. Average sample weight is 2 kg.

The samples should be taken manually or by using samplers. Manual point sampling method uses probes and scoops of different designs. The samplers are used for the selection of point samples with different mechanical designs.

Due to the lack of control for the most important wheat indicators as well as sampling only in the bulk-grain center the quality of grain is going down. In this regard, the studied enterprise has 6.7% of the total grain with the quality parameters much lower than when it was during purchase and placing into the grain storage. Since, there

is no active ventilation system at the enterprise, temperature increases and the grain of third class becomes the forage grain. So, we can clearly see this period when the price of the accumulated grain is less than the actual price. Therefore, the enterprise gets low rates of resource potential usage (Bogomolova *et al.*, 2015).

The researchers of this study recommended the management of the enterprise to introduce expansion of functional responsibilities for the employees which will ensure the quality of grain and increase safety of the enterprise resource potential. Calculations of the investment outlay proved that the reduction in lost profit will be around 5000 Thous. rub. or 3.7% from the total amount spent on the purchase of grain.

Calculations show that regulation of quality control stages in accordance with the control process map at grain procurement enterprises will significantly reduce the risk of grain damage and as a consequence, improve the resource potential management of a socially important regional enterprise and its competitiveness on the industry market.

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