

INNOVATIVE AND RESOURCE ASPECTS OF FOOD SAFETY PROVIDING

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Summary

Given article describes five-step algorithm proposed by authors that should help to provide food safety production, based on principles of actuality, responsibility and resource saving. There are different correlations and interdependences, levels and decisions of food safety providing shown at this article. The prerequisites and the role of innovation changes and renewable power sources described as well. The balance of key components of food enterprises' activity is proposed in the article.

Introduction

The food safety is the question and problem at the same time, that is rather serious, difficult, discussable and over actual. This problem has a geospatial aspect and spreads all over the World and touches upon all countries. Trouble statistic of people death, different mutations, spoiled health and so on focuses our attention on scientific way of solving these problems.

The main goal of this article is to show key factors that make an influence on enterprises' food safety production and to propose the way to provide it in orienting on costs minimization and resource saving approach.

Nowadays we can see that different governments, international organizations, unions and parties usually face to the food safety problem. It needs significant financial, staff, informational and other resources to overcome numerous obstacles at this sphere. Due to this, food safety problem moved to sphere of science and for now it needs new methods, rules and algorithms to be exploited.

To reach food safety we propose five steps algorithm accordingly to the main branch's characteristics and market participants.

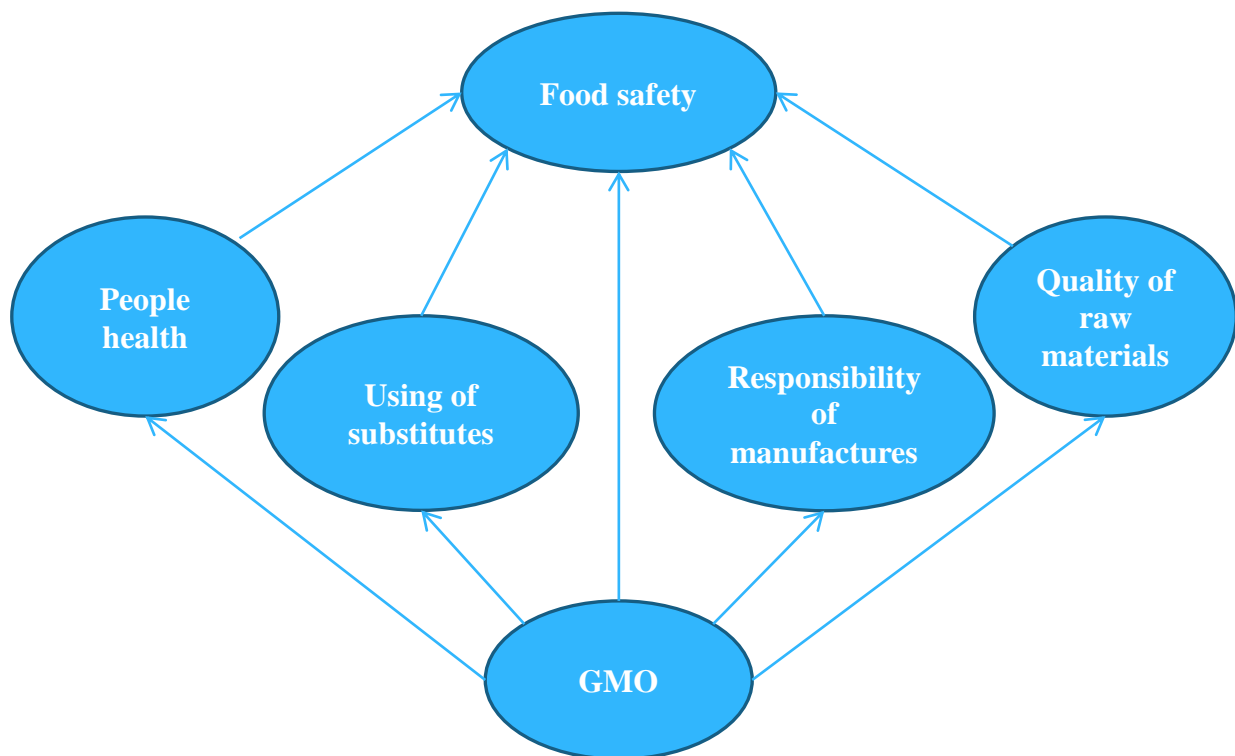
The first step of this algorithm is analyzing of key factors that forms food safety. To our mind, there are some aspects that became basic at food safety (Fig.1). They are:

- people health;
- using of substitutes.
- manufacture's responsibilities;
- quality of raw materials;

All these aspects are important. Each of them set different types of relations and intercourses at different ways and play their own significant role. But, as we can see, they cannot be separate from each other at the general goal of food safety providing.

At the same time we should understand that GMO products can make an influence to each of these elements. New technological processes, unrelenting market conditions, increasing demand and other factors force enterprises to use different food supplements, substitutes, including GMO.

Recognizing that, it needs to qualify what is the way of using GMO and nutrition supplements at all.



Source: created by authors

Figure 1. **Key factors of food safety actualizing**

So, the second step of our algorithm is recognizing the role of different nutrition supplements, including GMO, and making decisions of their usage. This step should help us to accept or decline a decision about including such components at products and about allowance of production at all.

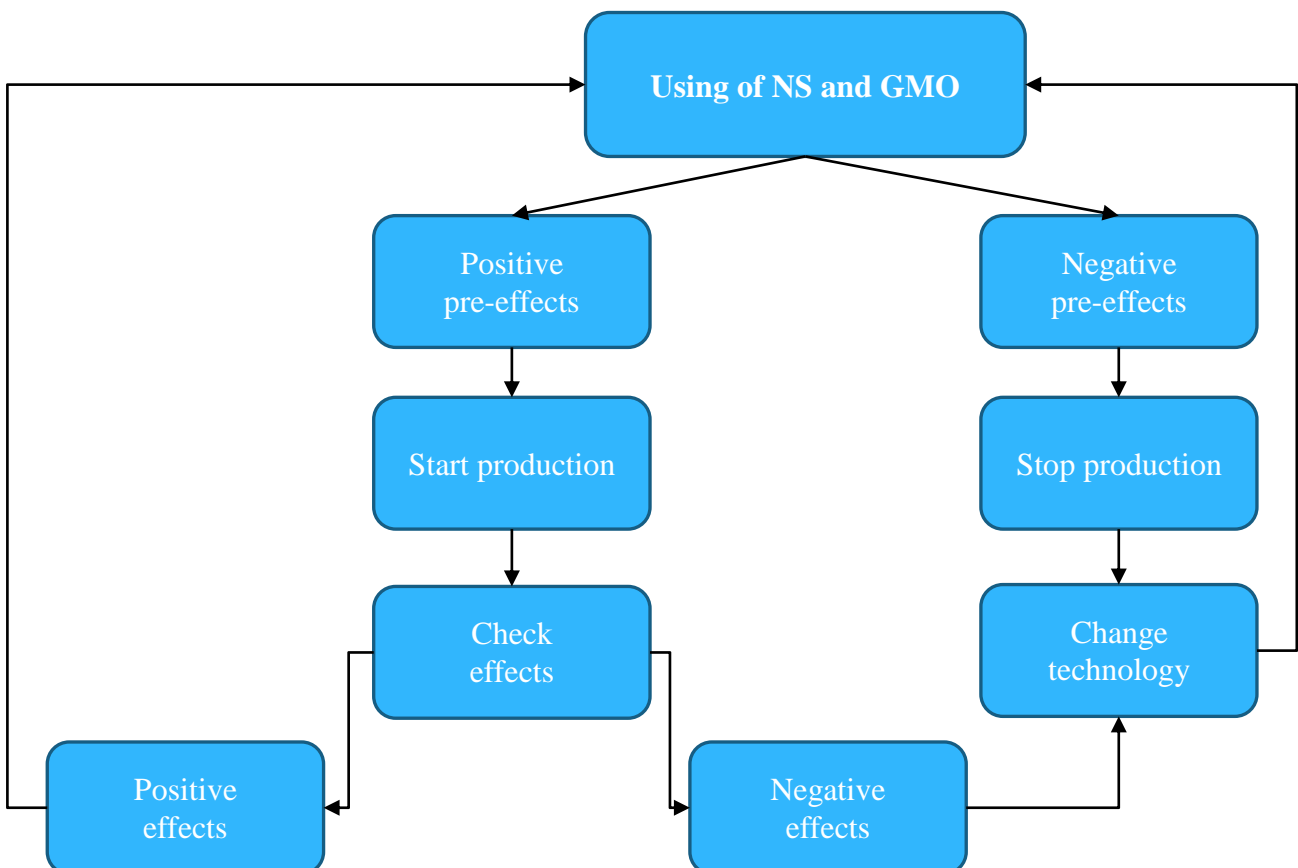
The basic questions at this step are:

- What kind of supplements are we going to use?
- What kind of products (goods) will be manufactured by using supplements?
- What kind of changes can they involve?
- Are these changes positive or negative?
- What are the pre-effects of introduction new technology?

We propose to see a basic algorithm of using GMO and nutrition supplements in detail (Fig.2)

First of all, we should be clearly sure that using of nutrition supplement is safe for people, for nature and for manufacture. The answer for this question we can receive from laboratory tests and test production or trial batch. After that, we should analyze it and make a decision about further production.

If we have negative pre-effects, we can say about unsafe technology of production. In this case, we should immediately stop production and try to change technology to admissible one. It means that we should back to the first stage and find more accessible decision.



Source: created by authors

Figure 2. **Nutritional supplements and GMO using**

If we have positive pre-effects, we can say about safe technology and safe method of

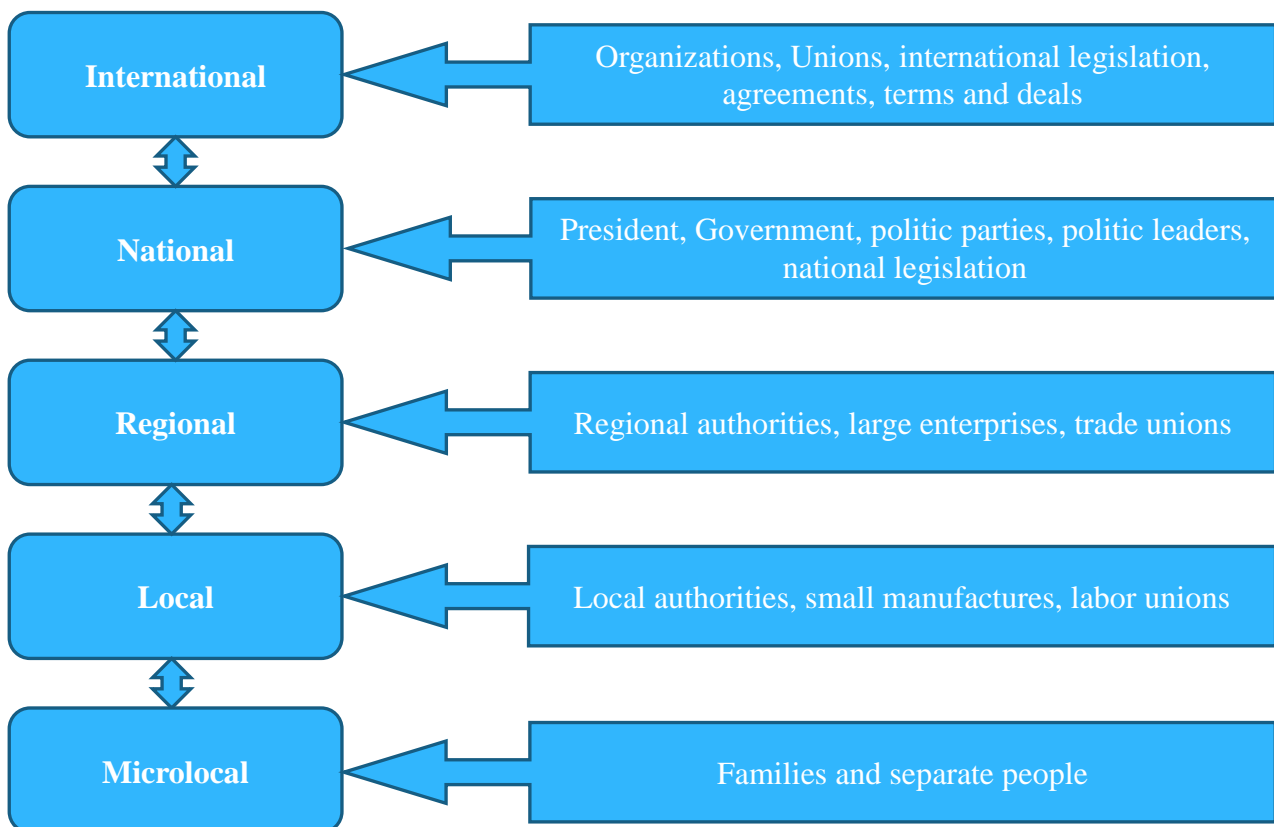
production. Such results show that this path is right and gives us an opportunity to increase food production and competitiveness therewith.

At the final stage of production we should check output effects and parameters of enterprise's goods once more and make a conclusion about expediency of such activity. Proper parameters mean positive effect and applying existing technology. Otherwise, we should change such technology to improve output parameters of goods or refuse it as we do when pre-effects are negative.

The realizing of this algorithm in practice must be supported by specialists in different production departments and by proper diagnostic tools. Also it needs quick reaction and decision-making mechanism.

The third step of algorithm means providing support of all available instruments that help to reach food safety. Such support should be effective and overall. That is why we propose to consider five levels of support to insure food safety goals (Fig. 3).

At the top we have international level. Different international organizations and unions represent this level. Key tasks and functions of it is providing food safety support by international



Source: created by authors
 Figure 3. Levels of food safety

legislation, by agreements, by terms and deals at macroeconomic level.

The next level of food safety is national. This level is provided by President's and

Government's activity, by politic parties and leaders, by national legislation. All these elements make a basic foundation and conditions to popularize, to stimulate and to support food safety projects, programs, ideas, technics and technologies in country.

The regional level makes an influence to current positions of a country and market conditions due to support of regional authorities, large enterprises and trade unions which oriented to safe production and proper human's life health.

At the next local level we define local authorities, small manufactures and labor unions which make additional continuous influence at solving problems at microeconomic processes.

Besides these levels, we propose to find out an influence of one more level. It is microlocal level. To our mind it is one of the most important elements of all economic system, because we have separate people and families influence to the economic processes at this level and activity of upper levels totally based on participants of this level. So, we have holistic system.

We should pay significant attention to the role of enterprises at this system.

As we said earlier, the food safety depends on responsibility of manufactures. Such responsibility connected with numerous characteristics and parameters of their activity. Among these parameters and characteristics in this way enterprises need proper managerial instruments and actions.

The proper managerial instruments and actions at food safety area forms the forth step of algorithm.

At this step we defined a cycle process that based on few stages (Fig. 4)

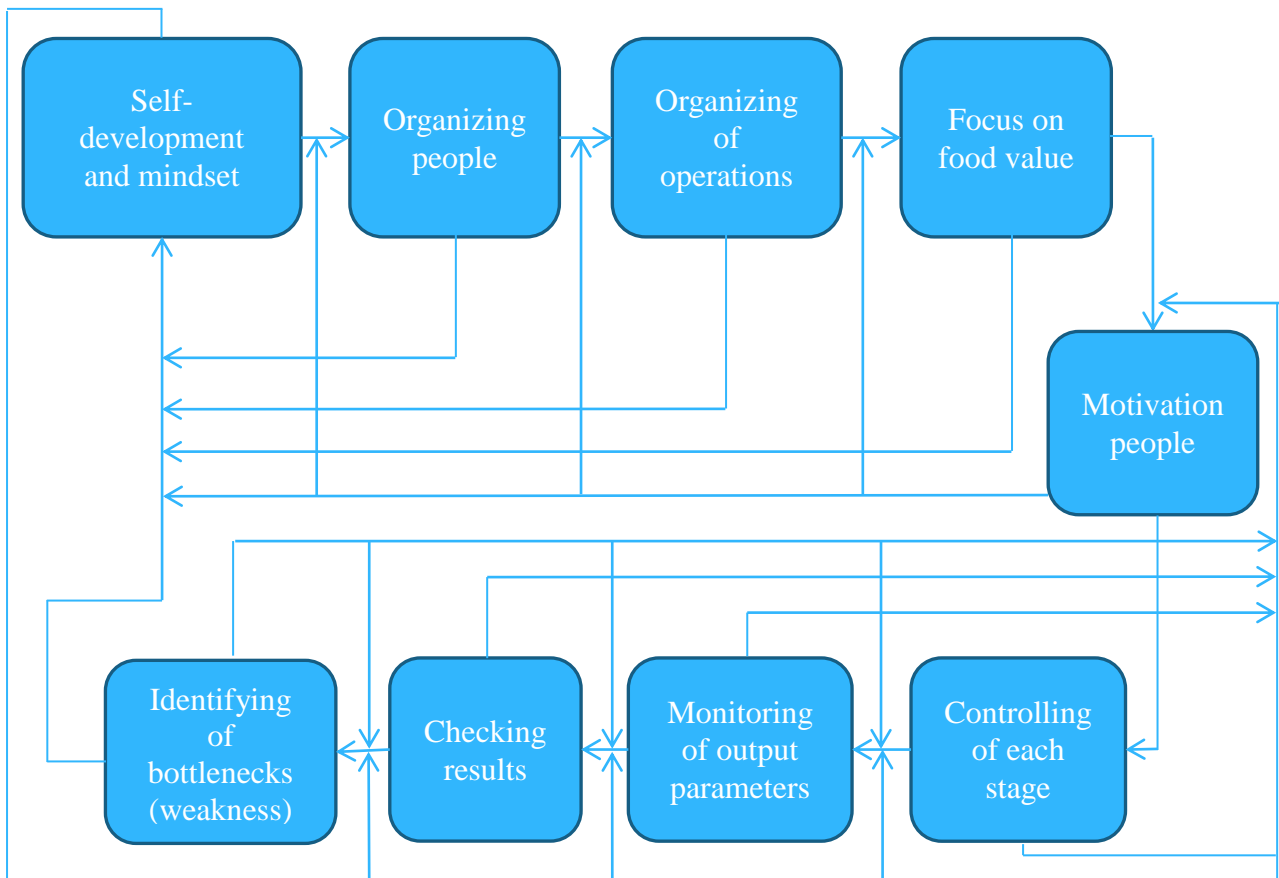
The cycle process start position is self-development and mindset. This stage is determinative, because innovative changes could not be progressive and successful without understanding of processes and without readiness to change. Trends of World's development show that new theoretical and methodological approaches are needed to provide fundamentally new economic processes, qualitative changes and up-to-date human activity. All these changes can be provided by innovation activity only [1].

After that we can organize people to work under such mindset. This makes a foundation to organize operations over the goals that have been set.

The main accent during operations should be set on focus on food value. This is necessary for achieving goals and doing tasks.

Previous stages belong to planning and organizational part of cycle. The next ones belong to motivation and control part. This part of the cycle is needed to be sure about food value and about well-done tasks at whole.

To realize it managers have to find a proper approach to satisfy people needs and interest and motivate them in this way. Besides, managers do some more important actions like controlling



Source: created by authors

Figure 4. **Managerial actions in food safety providing**

of each stage of production processes and monitoring of output parameters of products.

Such approach will help them to receive appropriate results. But given results must be checked anyway. Such checking should provide identifying of weaknesses.

As it shown at figure 4, every stage of given cycle can be successfully finished and bring on next stage or become incomplete because of inappropriate realizing of previous stages. It involves returning to such inappropriate previous stage to improve it and accomplish.

Thus, we can resume that the managerial actions are the one of basic tools of achieving food security. But there are some another aspects too that should to be count.

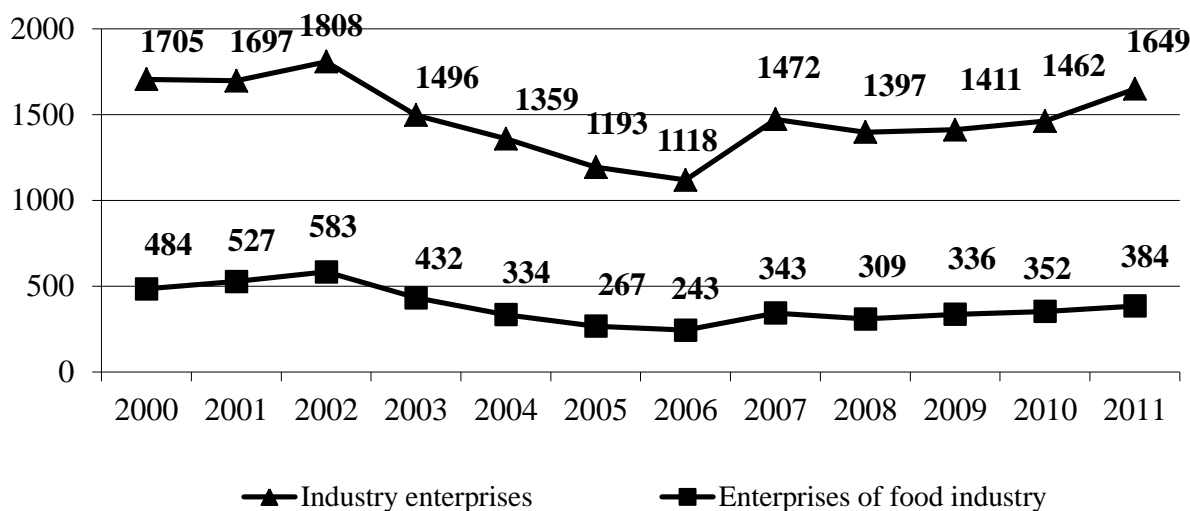
In the current context of globalization processes in the world economy and orienting on solving food problem the competitiveness of the food industry on world markets is determined by the rate of introduction of the latest scientific and technical solutions [2].

Global warming, periodic droughts and floods, other climatic changes and extreme situations, changing relative prices between agricultural products and the prices of gas, electricity, oil pose challenges to food industry and agriculture development.

To ensure effective operation of the food industry in such conflicting conditions it needs to

be oriented to the innovation type of development.

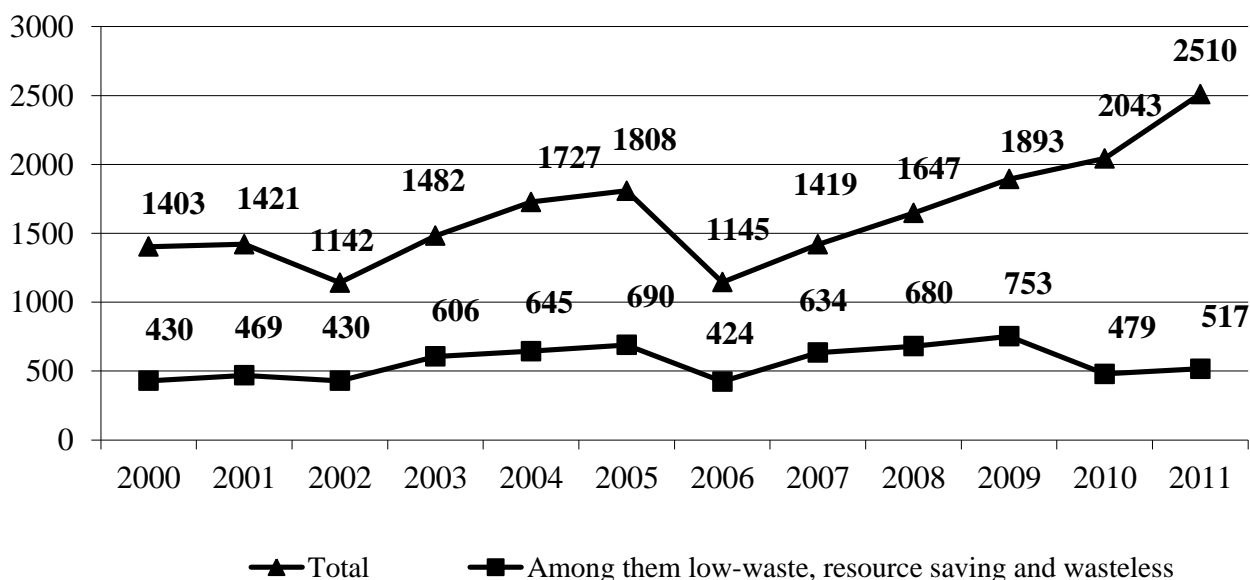
The analysis shows that in recent years the number of firms innovation, as in the food industry as in Ukraine in general characterized by unstable dynamics (Fig.5).



Source: created by authors on the basis of UKRSTAT data

Figure 5. Dynamic of number of firm's innovation in Ukraine

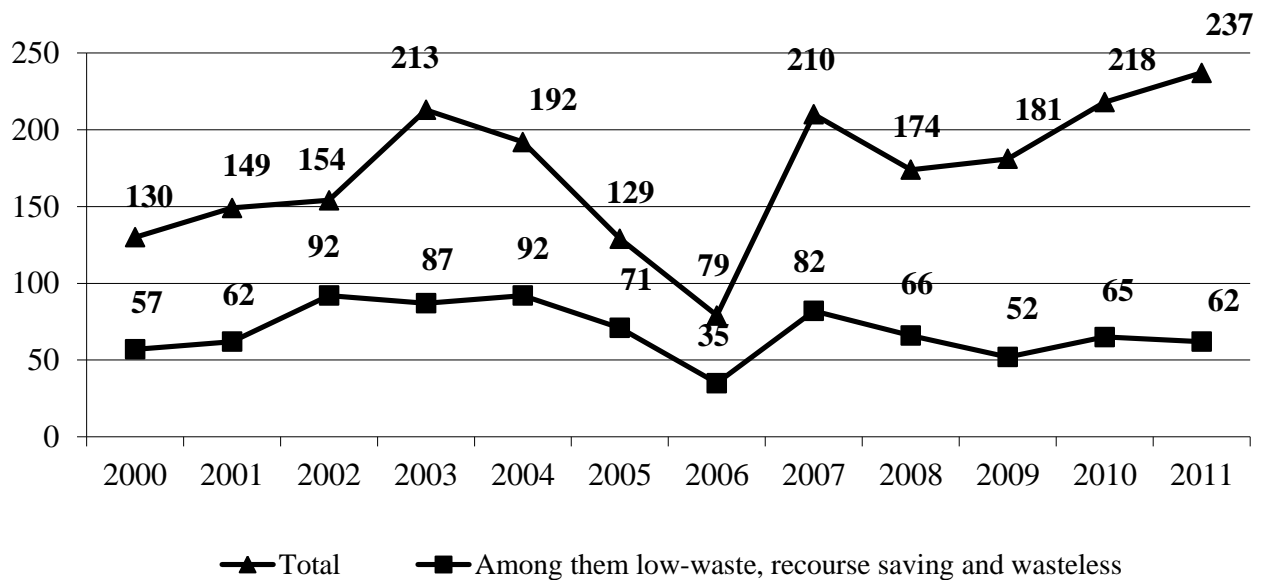
The dynamic of the introduction of advanced processes in Ukraine's industry is not comforting (Fig. 6).



Source: created by authors on the basis of UKRSTAT data

Figure 6. The introduction of advanced processes at the industrial enterprises of Ukraine

At the same time advanced processes in the food industry synchronously replicate the situation that emerged in Ukraine's industry at all (Fig. 7).



Source: created by authors on the basis of UKRSTAT data

Figure 7. **The introduction of advanced processes at the food industry enterprises of Ukraine**

The most popular direction of innovation activity is still introduction of new products or, in other words, product innovations. But the different aspects of food safety providing evidence that product innovation is mistakable without consideration of actualizing other types of innovation.

Among a number of innovation relevant to the development of Ukraine and the food industry is innovation in the field of technology, based on best practices and science, and which enhances the efficiency of the production system or product quality.

Especially it concerned with technical and environmental innovations. Thus, there is preferred direction of the enterprises' activity at present conditions based on the involvement of resource-efficient and renewable energy sources [2].

Technical and environmental innovations focused on solving problem of proper resource using and saving. It helps enterprises to reduce costs and to find out alternative way of satisfying customer needs.

Using of proper resources lays the foundation to proper food value and assurance that enterprises' turn-off will be sell well at relevant market conditions. Resource component forms product competitiveness and this makes an influence to enterprise's competitiveness.

In this way we should make an accent on the role of energy saving equipment and nonconventional renewable power sources using. Both components help enterprises to reach stable functioning and avoid resource and costs imbalances.

We propose to use balancing method in enterprises' activity that means harmonization and adjustment of all business components. It should be noted that using of this method is closely

connected with each step of proposed algorithm.

Balancing method makes possible to predict the development of the company in the future and to clarify the situation of uncertainty due to reducing accordingly the economic and financial risks. Success of using this method mostly depends on informational base availability.

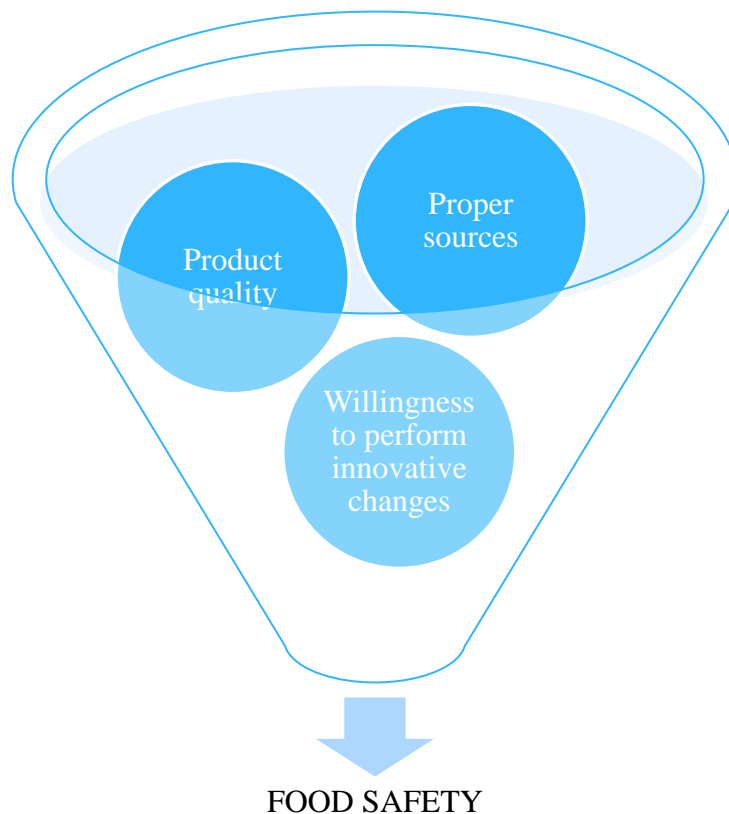
Information about resource and costs imbalances acts as a one of base instrument of balancing method. It concerned with recurrent analysis of congruent trends.

The levels of costs and resource imbalances allow the company to make conclusions about the advisability of corrective actions at the company to reduce costs based on estimates of future expected costs.

So, at the final step of algorithm we should to provide a balance of key components of food enterprises' activity to achieve food safety (Fig. 8).

As we can see the main components of key balance are willingness to perform innovative changes, proper resources and product quality.

Partial aspects of balance in providing food safety are financial and legislative supports. Each of these components is variable and difficult to forecast. It courses large fluctuations at economy processes and production values of enterprises. Such fluctuations can involve different changes in strategy and priorities of enterprises and make their activity inefficient at some projects.



Source: created by authors

Figure 8. **The balance of key components of food enterprises' activity**

So, consideration of these partial aspects and fluctuations processes is one of important tasks during definition of appropriate alternatives of enterprises' development and products' improving.

Conclusions

Summing up, it can be said that food safety providing concerned with numerous innovative and resource aspects and procedures that are need to be held. There is the five-step algorithm to realize them. It covers as decision-making concept of using nutrition supplements and other managerial actions, as counting of levels of food safety support and the balance of key components of food enterprises' activity. It greatly depends on qualification and willingness of enterprises' managers and support of proper resources, like nonconventional renewable power resources, technics and legislation.

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