

## AGRICULTURAL SCIENCE IN LATVIA

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**Abstract.** The paper describes the development of agricultural science in the last 20 years in a context of the development of science in Latvia. It characterizes the changes in legislation connected with the development of science, the problems with science potential and the development of doctoral studies. The structure and provision of funding for science, including using of the EU structural funds is described.

**Keywords:** science, agriculture, engineering.

### Introduction

After the restoration of independence in Latvia in 1991, significant changes have taken place in agriculture: change of the form of ownership, change of the management system, change of specialists and generations. Furthermore, the changes have significantly affected the agricultural science: employment in science has reduced by more than six times, the number of scientific institutions has reduced, the number of scientists working in the university has increased, closer integration of higher education and science has occurred. The laboratory equipment is outdated and the proportion of currently working retired scientists has increased. After joining the European Union in 2004, new opportunities and challenges opened for both - agriculture and agricultural science in Latvia. These opportunities are successfully taken by the scientists of Latvia in the way of applying for funding of projects from the EU funds and programmes.

### Legal basis

Straight after the establishing of the independent Republic of Latvia in 1991, significant changes have taken place connected with the change in the political system in the country. Many normative acts were elaborated for readjustment and improvement of study and scientific work as well as other fields of action. The newly established Latvian Council of Science (LCS) started to work with a target to democratize governance of scientific actions and to assure effective usage of funds allocated from the state budget for research project funding. The main target for the LCS was, and is still now to promote the elaboration and implementation of the science and technology development policy in Latvia.

To insure the impartial analysis of the scientific research fields and scientific potential, in 1992 an international evaluation of scientific fields in Latvia was performed in compliance with the agreement among the LCS and the Scientific Council of Denmark. The results of the evaluation of the Latvian scientific accomplishments were positively evaluated in the resolution of the European science representatives and were set as a basis for further development of the science sector in Latvia [1].

A new *Scientific law* was legislated that year, targeted to secure the preoccupation of the state for science as a particularly significant precondition of development of society.

In 2001 the Ministry of education and science elaborated "Guidelines for higher education, science and technology development, 2002-2010" [3] with the aim to improve the development of higher education, science and technology, by modelling them as a long-term basis for the development of society, economics and culture. But further advancement of this document was stopped thus leaving the set targets in the state of goodwill.

On May 18, 2005, a new *Law of scientific actions* [4] was enacted, where for the first time a condition about the scientific funding was included, namely, the annual growth of the funding for scientific activities should be at least 0.15 % from the GDP, till the amount of state funding reaches 1 % from the GDP.

*The Guidelines for the Development of Education, 2009-2013*, approved on October 25, 2009, by the Cabinet of Ministers of the Republic of Latvia (MK) foresee to increase the competitiveness of higher education and the role of science and research in higher education institutions.

At present, the final version for the Latvian National Reform Programme “ES2020” for Implementation of the Strategy (Latvian NRP project) is being developed. In the Latvian NRP project several quantitative targets for 2020 are stated: to reach a 73 % level of employment, to increase investments in research and development (R&D) up to 1.5 % from the GDP, to increase the number of people with higher education to 34-36 %, to decrease the percentage of students who have not finished school to 13.4 %, to decrease the percentage of people subjected to the risk of poverty to 21 %, etc.

### Funding for Science

In Latvia, starting from 1991, distribution of funding is performed by the LCS with elected expert commissions. Thus, all scientific funding is divided within a tender procedure, which encourages quick acquisition of project writing and implementation. However, for a long time, the funding was negligible both in absolute LVL and in percentage from the GDP, which was the reason why the scientific system had to function in the regime of survival (Fig. 1 and 2) [5].

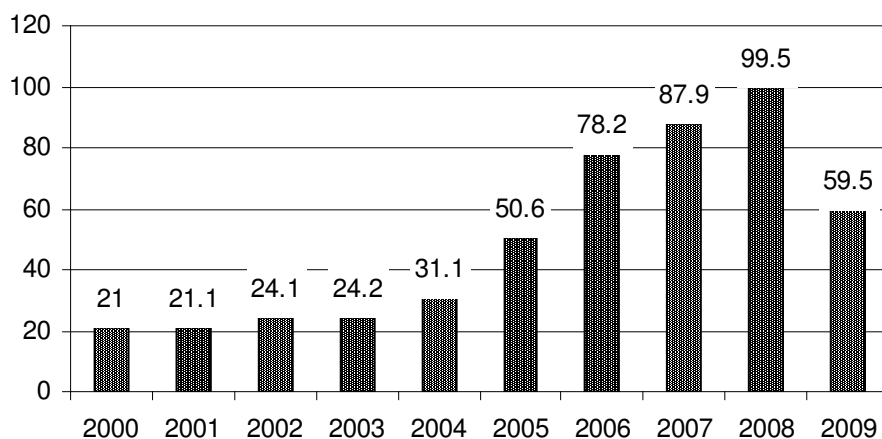


Fig. 1. Funding of science, million LVL,  
source: Central Statistical Bureau of Latvia

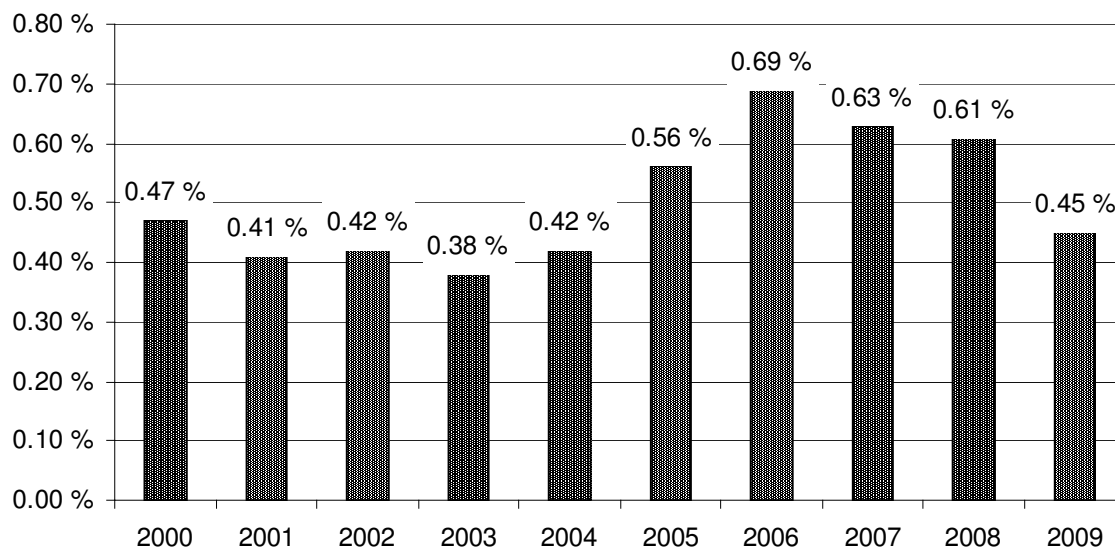


Fig. 2. Intensity of science funding, percent from GDP,  
source: Central Statistical Bureau of Latvia

The growth of funding from 2005 and 2008 is mainly linked with the funding from the EU structural funds. At present, the funding for science is insufficient both in percent from the GDP and in absolute numbers, particularly because of the relatively low level of the GDP per capita in Latvia. Intensity of the funding for science in Latvia is more than four times lower than on average in the EU.

It is also lower than in the neighbour countries – Lithuania and Estonia where the funding has increased since 2007 (at the same time in Latvia, just the opposite, the funding has decreased). In 2006, the funding for science (percent from the GDP) was 0.69 % in Latvia, 0.79 % in Lithuania, and 1.11 % in Estonia, but in 2009 – 0.45 % in Latvia, 0.84 % in Lithuania, and 1.42 % in Estonia [7].

In compliance with the Lisbon strategy, the funding for science in the EU countries had to increase and reach 3 % from the GDP, including 1 % of state funding and 2 % of business funding. As it can be seen, it is a distant and difficult goal for Latvia.

The funding for agricultural science in Latvia has increased from 1.2 million LVL in 2001 to 2.4 million LVL in 2005, which makes 5-6 % from the total funding for science [2].

Starting from 2008, the state scientific institutes, universities and scientific institutions of the state universities receive base funding for scientific operations in the established procedure by the Cabinet of Ministers. Base funding for scientific operations of the scientific institutions is targeted for several positions [6]:

- for upkeeping of scientific institutions (maintenance of premises and equipment, public services, wages for the administrative, technical and maintenance personnel);
- for wages of the scientific personnel (involved in carrying out the research).

Base funding can be used also as a co-funding for EU structural fund project implementation.

### Scientific personnel

The second problem after funding for scientific institutions is insufficient number of scientists with a doctoral degree and unfavourable age structure (Fig. 3) [5; 8].

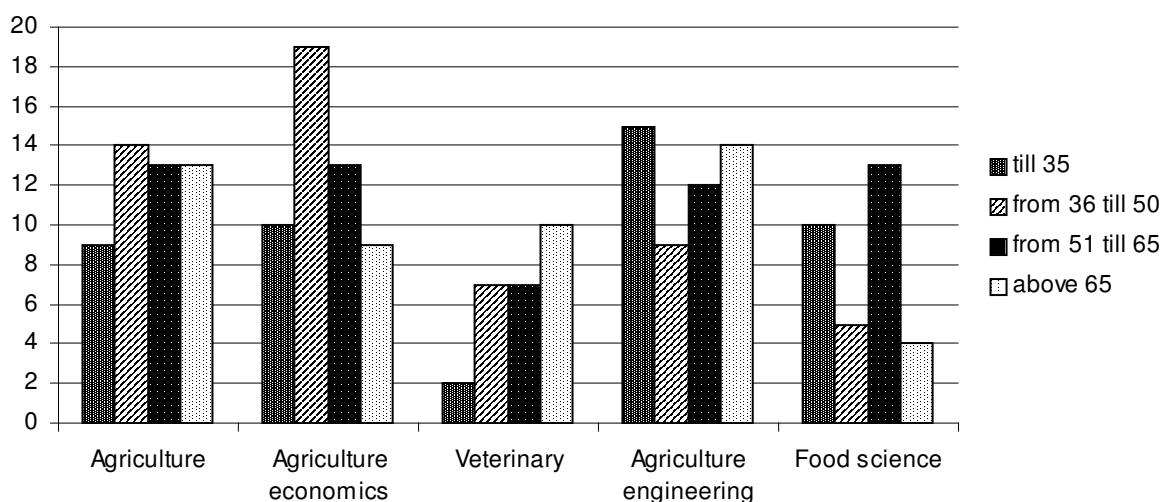


Fig. 3. Age structure of doctors working in sub-sectors of agricultural sciences in 2010

Food science is in a good position, with many new scientists and yearly preparation of 3-5 doctoral theses, and a comparably small amount of doctors above the age level of 65 years. The age structure is balanced in agricultural economic sciences, yet there is also a significant number of experienced (above 65 years) scientists in the total proportion of scientists. In the rest of the sub-sectors of agricultural sciences, the situation has improved in the recent years, although the proportion of the experienced scientists is still comparably large. The position has significantly changed in agricultural engineering, because the proportion of new doctors has rapidly increased, although still there is a relatively large number of experienced scientists.

The situation is critical in the sub-sectors of veterinary medicine and agricultural engineering, and even the optimistic forecast about the number of young scientists will not be able to fill the positions of retired (Fig. 4) [8].

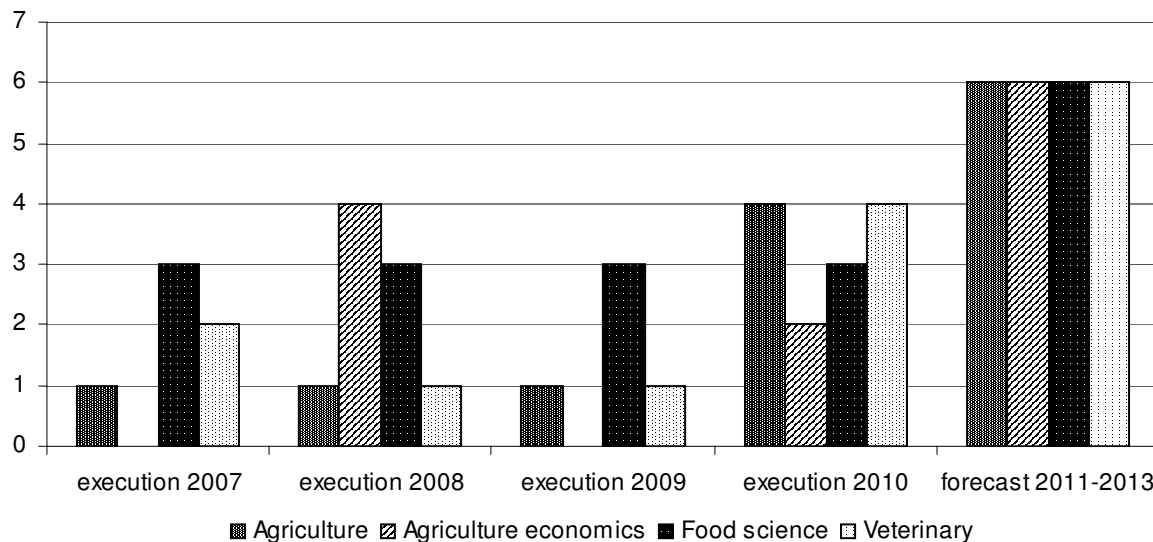


Fig. 4. Defended doctoral theses at the Latvia University of Agriculture, and forecast for 2011-2013

The third most significant problem in agricultural science refers to the very weak distribution and practical application of the results. Therefore, also support for science from the farmers and agricultural service organizations is weak.

In 2007, there were 4223 scientific employees working in Latvia. For productive work of the R&D sector and provision of its development, at least 2 000 scientists are necessary per 1 million inhabitants. To approach this level, the total number of scientists working in the R&D sector in Latvia have to reach at least 5 000 in 2013. In 2007 there were 3.8 scientists per 1 000 employed in Latvia; at the same time in the EU – 25, this parameter is 5.4, and in Finland it reaches 16.2 [5].

The number of national patents is small (100 – 150 patents issued annually) and their significance from the point of view of competition is not high. According to the number of patents per 1 000 inhabitants, Latvia considerably falls behind the economically developed countries in the world (compared to Finland and Sweden, this parameter is 50 times smaller in Latvia). The Latvia University of Agriculture scientists submit 20-30 patents yearly, i.e., every fifth patent is from the Latvia University of Agriculture [5; 8].

In the recent years, several positive tendencies have appeared in the agricultural science in Latvia: development of doctoral studies by using the EU structural funds; development and upkeeping of the resource base of scientific institutions by base funding and the EU structural funds; establishment of a united system of identification and registration of the scientific potential; establishment of the technology transfer centre of the Latvia University of Agriculture; active participation in several internationally significant research projects and networks; development of cooperation with international scientific organizations. All the mentioned brings hope for the better future for agricultural science in Latvia.

## Conclusions

1. Sufficient funding for science is an essential factor for sustainable development.
2. Outdated research infrastructure and scarce number of contemporary equipped laboratories in scientific institutions significantly obstruct collaboration in international research projects.
3. With the support of the ESF, preparation of new doctors and setting up of the group of scientists in agricultural sciences is improved.
4. There is insufficient cooperation and exchange of information about scientific and innovative accomplishments, especially in the level of schools.
5. There should be more activity in the development of the commercialization process of knowledge.

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