

New technologies and economically viable solutions for local feed production for pig farming

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For the first time in Latvia, an interdisciplinary study has been conducted on the effective expansion of the local feed production market, evaluating the possibilities of soy cultivation and use in Latvian conditions in order to reduce the dependence of the pig industry on imported protein feed. The security and sustainability of the food system can be guaranteed by increasing locally grown raw materials, including GMO-free soybeans. Soy adaptation in the Baltic / Nordic region is a new opportunity and challenge posed by climate change. Soybean sown areas have increased in recent years to 2100 in Lithuania and 300 ha in Latvia (2019). EU green policy supports the efficient use of local resources to reduce soybean imports and increase self-sufficiency. Currently, EU countries produce only 5-7% of total soy protein consumption. The study comprehensively analyzes the technological and economic side of local fodder production, including the contribution of various legumes and cereals, especially soybeans and hull-less barley, to the production of high-quality feed made from local resources. For the needs of the research, soybean cultivation experiments were performed in six different regions of Latvia in order to find out the most suitable soybean varieties and cultivation technologies, to identify risk factors affecting soybean productivity, to assess the quality of local soybeans and meet feed producers' requirements. The results of a three-year study showed that the right choice of varieties, the choice of the optimal sowing time and successful weed control are crucial for the cultivation of soybeans in the farms of Latvia. It is necessary to further improve soybean cultivation technologies so that the area of soybean production can be successfully expanded in the territory of Latvia. The study showed that soybean cultivation is a prospect in mixed farms using self-grown soybeans for fodder. Private crop and feed production, pig breeding companies are involved in the implementation of the research, implementing various experiments in industrial conditions. This provided evidence that extruded cake of self-grown soybean is equivalent to imported soybean products. The benefits of soy cultivation are protein-rich feed and soybean oil production, as well crop rotation diversification. The authors of the study propose a new concept of economic nutrient units (ENU), which allows comparing different sources of nutrients, assessing their economic value and the environmental impact of production. This indicator makes it possible to compare different nutrient sources with different biochemical compositions. The results of the study show that the economic value of locally grown protein crops (soybeans, field beans, peas, lupins, including barley) exceeds their production costs, but the market does not always value the nutrients in them, reducing the incentive for farmers to include them in their farming system. This is the future challenge for farms to balance productivity and competitiveness with the requirements for climate neutrality policies. The results of the study confirm that each hectare of protein crops - soybeans, field beans, peas, included in crop rotation alongside winter wheat and oilseed rape would reduce total GHG emissions from crop rotation by 350-850 kg CO₂ eq.