

The title of the project topic is: IRN №AP19679802 "Development of working bodies for forced crushing and grinding of feed from waste of plant and animal origin".

Relevance: many feed preparation lines include pre-crushing and final grinding. Carrying out crushing and grinding in a phased sequence of destruction of raw materials is often associated with limiting equipment overloads. At the same time, in the process of destruction of the processed raw materials, the working bodies of the technological equipment are of primary importance, through which the raw materials are divided into parts. The idea of the project is to develop intensive working bodies that can eliminate the cases of unused areas (empty zones) of the surfaces of the working bodies, and increase the efficiency of the working bodies for coarse, medium and fine grinding, while taking into account the possibility of improvement due to engineering ideas and theoretical justifications. The project complies with the principles of the "Green Economy", with a focus on waste processing and is a solution to the urgent problem of feed preparation processes.

Purpose: development and design of various working bodies for crushing feed ingredients from waste of plant and animal origin with the rapid production of feed products of various fractions.

Expected results: science-based hypotheses will be found based on existing theories of cracking, impact, brittle fracture, deformation, shear, wave theory, engineering ideas and up to 7-10 main factors affecting the mechanical processes of crushing and grinding in the production of feed from plant and animal waste will be identified. 3 (three) patents from the National Institute of Intellectual Property will be applied for. Simulation of the mechanical processes of crushing and grinding will be carried out with the construction of a mathematical model, which will make it possible to intensify the action of the working bodies for crushing and grinding feed to obtain a fraction of the required size from the resulting plant and animal waste. The results of research will be published in 1 (one) article or review in a peer-reviewed foreign or domestic publication recommended by the Committee for ensuring control in the field of science and higher education, as well as in 2 (two) articles and (or) reviews in peer-reviewed scientific publications indexed in the Science Citation Index Expanded Web of Science database and (or) having a CiteScore percentile in the Scopus database of at least 35 (thirty-five). A number of structures of the working bodies of devices for crushing and grinding to obtain coarse, medium and finely ground feed will be designed and constructed. Scientific and technical, design documentation will be developed. Research results will be published in 2 (two) articles and (or) reviews in peer-reviewed scientific journals indexed in the Science Citation Index Expanded of the Web of Science database and (or) with a CiteScore percentile in the Scopus database of at least 35 (thirty-five). The results of the project will be reported at scientific conferences, seminars, forums.

Research team members:

Ruslan Maratbekovich Iskakov - Candidate of Technical Sciences (PhD), Associate Professor, Project Manager

(*Scopus Author ID: 55965285900, Researcher ID: P-7436-2017, ORCID: 0000-0002-5948-2636,*

[https://www.scopus.com/authid/detail.uri?authorId=55965285900;](https://www.scopus.com/authid/detail.uri?authorId=55965285900)

[https://publons.com/researcher/2045750/ruslan-maratbekovic-m-iskakov/;](https://publons.com/researcher/2045750/ruslan-maratbekovic-m-iskakov/)

[https://orcid.org/0000-0002-5948-2636\);](https://orcid.org/0000-0002-5948-2636)

Toktar Abilzhanuly - Doctor of Technical Sciences, Professor, Senior Researcher

(*Scopus Author ID: 57193110431, ORCID: 0000-0002-9513-1702,*

[https://www.scopus.com/authid/detail.uri?authorId=57193110431,](https://www.scopus.com/authid/detail.uri?authorId=57193110431)

[https://orcid.org/0000-0002-9513-1702\);](https://orcid.org/0000-0002-9513-1702)

Aleksandr Alexandrovich Gulyarenko - PhD, Associate Professor (Associate Professor), Researcher

(*Scopus Author ID: 57201112442, ResearcherID: P-5862-2017, ORCID:*

0000-0002-4562-367X,

[https://www.scopus.com/authid/detail.uri?authorId=57201112442,](https://www.scopus.com/authid/detail.uri?authorId=57201112442)

[https://www.webofscience.com/wos/author/record/P-5862-2017,](https://www.webofscience.com/wos/author/record/P-5862-2017)

[https://orcid.org/0000-0002-4562-367X\);](https://orcid.org/0000-0002-4562-367X)

Aru Zhalgasbaykyzy Ukenova - Master of Agricultural Sciences, Junior Researcher

(*Scopus Author ID 57730406100, ResearcherID: GYV-3924-2022, ORCID:*

0000-0002-2797-672X,

[https://www.scopus.com/authid/detail.uri?authorId=57730406100,](https://www.scopus.com/authid/detail.uri?authorId=57730406100)

[https://www.webofscience.com/wos/author/record/35034142,](https://www.webofscience.com/wos/author/record/35034142)

[https://orcid.org/0000-0002-2797-672X\).](https://orcid.org/0000-0002-2797-672X)

Information for potential users: the target consumers of the expected results of the developed working bodies for forced crushing and grinding are design bureaus, higher educational institutions, farms, feed preparation shops.

Additional information: scope - agricultural engineering.