

## Applied Digitalization in Soybean Production

**Dautkanov Nurlan Buratovich**

LLP "Kazakh Research Institute of Processing and Food Industry", Almaty, Republic of Kazakhstan

**Dautkanova Dina Rakymkulkyzy**

LLP "Kazakh Research Institute of Processing and Food Industry", Almaty, Republic of Kazakhstan

**Usembayeva Zhibek Kalieвна**

LLP "Kazakh Research Institute of Processing and Food Industry", Almaty, Republic of Kazakhstan

**Kazhymurat Asemay Talgatqyzy**

LLP "Kazakh Research Institute of Processing and Food Industry", Almaty, Republic of Kazakhstan

### Abstract:

There are many sectors of the economy where the use of AI and other digital activity methods is necessary due to the territorial scale and cost of using human participation, this is agriculture, namely crop production. In particular, the production of soybeans for further industrial processing into food ingredients. The widespread use of AI requires the creation of a regulatory framework and its harmonization with existing industry standards. The longest period of full-scale implementation of AI is expected in agriculture, where all processes are long in time and large-scale in territory. If at the stages of industrial processing the use of digital technologies and artificial intelligence is not difficult due to the compactness and intensification of technological processes, then the cultivation of raw materials, harvesting, transportation and storage require a different approach to digitalization.

Considering the stages of soybean cultivation on large areas for monitoring agrotechnical measures, two experimental prototypes of the control mast equipped with video recording devices, thermometers, anemometer, autonomous power supply system, communication channel, lightning rod were used. This completeness of the pilot project is basic, which will be improved in the process of scaling and operation of interested parties. The purpose of the test was to identify the optimal characteristics of the technical equipment for determining the maximum distance of data transmission without distortion, as well as testing control mechanisms throughout the growing season of soybeans for analyzing information flows. A remote-control system for soybean cultivation was created, including a control and measuring mast (CMM). The purpose of the control system for traceability of the quality of soybeans intended for the production of soy protein isolate. Also, monitoring of soybean varieties included in the State Register of Breeding Achievements was conducted, where 64 soybean varieties are registered that are recommended for cultivation in the regions of the country, as well as the predicted gross yields of soybeans.

### Keywords:

AI, digitalization, CMM, SPI.