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Professor M.I. Daishev's Career (95th Anniversary of the Scientist's Birth)

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Abstract

The authors of the biographic essay give the data of M.I. Daishev's achievements. He was one of the leading scientists in the sphere of sugary products in the USSR and Russia. The main idea of the article is to present and explain the main stages of scientific and pedagogical activity of the scientist in the field of sugary production technology. The article listed the main scientific works and achievements of the researcher in this sphere of activity.

Key words: scientist, teacher, researcher, scientific achievements, technology of sugary products, food technology, sugar factory.

Аннотация

В биографической статье-очерке приведены данные о творческом пути профессора М.И. Даишева, являвшегося одним из крупнейших отечественных учёных в области сахаристых продуктов. Цель статьи – кратко отразить основные этапы научно-педагогической деятельности учёного в области технологии производства сахара. В работе перечислены основные научные работы и достижения исследователя в данной области.

Ключевые слова: учёный, педагог, научные достижения, технология сахаристых продуктов, пищевые технологии, сахарный завод.

Fig. 1: Dr. of Tech.Sc., Professor M.I. Daishev

Introduction

The 95th anniversary of Midkhat Iskhakovich Daishev's birth is in 2020. He was a Professor, Doctor of Technical Sciences, Honored Scientist of Kuban, a leading scientist in the field of sugary products, a teacher, and the head of the Department of Sugary Products Technologies from 1969 to 1993. He was the author and a co-author of more than 150 scientific works published in our country's and international journals. The scientist received more than 35 author certificates and patents. Almost 17 Candidates of Technical Sciences (among them 4 foreign post-graduate students) were consulted by M.I. Daishev and successfully defended their theses.

The *purpose* of the article is to define the main stages of scientific and pedagogical activity of M.I. Daishev in the field of sugary production technology.

The relevance of the essay is that the Professor's theoretical and practical ideas in the field of sugary products are still applied today in the scientific works of his students and followers.

The *methodological basis* of the essay includes articles and guidance notes of the scientists in sugary production technology [8, p. 14–15; 4, p. 49; 3, p. 75; 7, p. 21; 6, p. 128; 9, p. 225; 1, 88–94].

First Stage

Therefore, in 1942 M.I. Daishev entered the Central-Asian Polytechnic Institute (now the Tashkent State Technical University) the Faculty of Chemical Technology. In 1944 however, he had to join the army where he served in a mortar regiment operating in Czechoslovakia. After demobilization in 1946, he resumed his studies at the Institute, but at another Faculty dealing with Sugar and Starch Production Technology that he graduated in 1951.

The theoretical knowledge gained at the Institute allowed M.I. Daishev to move into scientific activity in the field of sugary production. In 1952 he pursued postgraduate studies and in 1955 he successfully defended his PhD thesis "The Research of the Massecuite B (the last) Centrifugation Process of the Beet Sugar Factory" [5], written under Isaac Fedorovich Zelikman's direction. At that time, he was the head of the Department, a Professor, Doctor of Technical Sciences and a specialist in the sugar-refining production sphere.

Second stage

In September 1955 Midkhat Iskhakovich was appointed as an assistant at the Department of Technology of Sugary Substances. The scientific articles that he wrote during his postgraduate studies became the basis for his further activities in the chosen field. In 1957 the young scientist joined the Institute of Chemistry of the Kyrgyz SSR Academy of Sciences in Frunze (now Bishkek) as a junior researcher at the laboratory of the chemistry of plant raw material. In 1961 he was invited to Krasnodar Food Industry Research Institute as a senior researcher at the sugar technology laboratory of the Sugar Industry Department. In 1964 he was elected as the head of the Juice Purification Laboratory.

Third Stage

In 1968 due to the sudden death of Professor I.F. Zelikman, the head of the Department of Technologies of Sugary Substances of the Krasnodar Polytechnic Institute (now the Kuban State University of Technology), M.I. Daishev was appointed to the post. He directed the staff not only in administrative terms but also took part in the existing research work and supervised postgraduate students' scientific works of the Department.

In 1969 the University confirmed his tenure as the head of the Department, where he worked until 1993. After that he continued to work as a professor at the Department until 1999.

It is worth mentioning that in 1972 employees of the Department under the direction of M.I. Daishev developed an efficient scheme for obtaining sugar of refining value in one-stage production [8], which is still relevant and in demand at the sugar factories that process imported raw sugar.

According to his followers' ideas, the scheme for processing raw sugar cane into "white crystals of refined value" at the sugar-beet factories was highly appreciated by a great number of international sugar-refinery specialists.

It should be pointed out that the scientific research conducted at the Food Industry Research Institute, at the Department of the Krasnodar Polytechnic Institute and at the sugar factories of Kuban served as the basis for a doctoral thesis "The Research to Enhance the Effects of Purification and Crystallization in Sugary Production". In 1975 he defended his thesis at the Soviet Union Research Institute of Sugar Industry in Kiev [4].

The conclusions and suggestions given in his doctoral dissertation [4] were put into the practice. They are the following:

1. The scheme of raw juice purification with two-stage pre-carbonation and separation of pre-carbonation juice residue (a co-authorship with G.A. Vovk) was used at the Timashevskiy sugar factory.
2. The carbonator with an internal organized circulation of the solution for lime-carbon dioxide purification of concentrated sugar solutions (certificate of authorship in collaboration with K.P. Zakharov) was used at the Vyselkovskiy and Pavlovskiy sugar factories.
3. The method of the last massecuite boiling with run-off extraction (a certificate of authorship in collaboration with I.N. Akindinov, K.P. Zakharov, N.A. Lyusyi) was used at the Pavlovskiy sugar factory.

Each proposed solution was cost-effective and was important for each stage of production.

Fourth Stage

The next important step in the scientific activities of M.I. Daishev was his approval in the degree of Doctor of Technical Sciences in 1976. In 1977 he was awarded the title of professor.

The new approach to the studying of the calcium carbonate non-sugars' adsorption, theoretical aspects of the sugar production coloring agents' adsorption by the activated carbons were developed with the direct participation of the scientist [9].

In 1982 postgraduate students R.S. Reshetova and Yu.I. Molotilin developed the "Scheme of the Separation of the Highly Overcarbonated Residue to the Main Liming for Typical Sugar Plants" after laborious theoretical and practical work under M.I. Daishev's direction [3].

The scheme was implemented at the Malorossiyskiy sugar factory in Krasnodar region. At that time, there was a breakthrough in the technology and theoretical understandings of the physic-chemical processes in lime and carbon dioxide purification of the sugar solutions in the production sphere [8]. Nowadays, this theory is used to develop the improved methods of the quality of juice and the expenditure reduction of the auxiliary materials both theoretically and practically [2].

Fifth Stage

The next and the last step of his life path was his scientific and pedagogical activity at the Department as a professor. He started to pay more attention to scientific work when he was free from the administrative work as the head of the Department. The area of the scientific interests of Midkhat Iskhakovich included theoretical framework of the sugary production technology, physic-chemical processes of the sugary production semi-products' purification in particular. A great number of his academic articles and developments is dedicated to above mentioned aspects.

M.I. Daishev created a theory of adsorption purification of limed sugar solutions. It was highly appreciated not only in Soviet Union but also in many countries [7]. The non-conventional, effective methods of lime and carbon dioxide purification based on his theory are successfully used in the modern sugar production.

Fig. 2: Professor I.F. Zelikman with the postgraduate students.

From left to right: T.R. Abdurashidov, I.F. Zelikman, M.I. Daishev.

Fig. 3: M.I. Daishev in lecture room at Krasnodar Politechnic Institute.

There are three photos in this essay (Fig. 1, Fig.2, Fig.3) that belong to the personal archive of an author of the given article A.M. Daisheva.

The processes of sugar extraction from the sugar beet were the other sphere of his scientific interests. These researches allowed finding a mathematical solution to the question on the impact of the pulp-press water return on the performance indicators of the diffusion apparatus [7]. It is a theory of the diffusion and press extraction of the sugar from the sugar cosettes.

The results of the developments were actively applied in the industry. Thus, the next technological processes were implemented: two-stage carbonation-processing mode of the raw sugar melt, sugary production of the refining value from raw sugar, scheme of the raw juice purification with the separation of pre-carbonated residue to the main liming and cold pre-liming and cold and warm main liming. (In 1978 it was included to the model scheme of raw juice purification and is used till now) [6].

Conclusion

M.I. Daishev was a member of the Sugar Industry Section of Scientific and Technical Council of the Ministry of the USSR and RSFSR Food Industry.

He was a member of the expert group of the Higher Attestation Commission of the USSR on the agro-industries; specialized councils of PhD theses defenses in Krasnodar Polytechnic Institute; specialized councils of Doctoral theses defenses in Moscow Technological Institute of the Food Industry.

He was a deputy editor-in-chief of the scientific magazine “Proceedings of USSR Universities. Food Technology” and a member of editorial board of the magazine “Sugar”.

After Midkhat Iskhakovich’s death, the Department of Sugar Products Technology was named after him up to the reorganization of the Department.

Summing it all up, we can point out that M.I. Daishev’s scientific theories and developments are highly appreciated and applied in the modern production. There is a great number of scientific works of his students and followers based on his ideas. He mastered and created the generation of the scientists in the field of sugary production.

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