

# **Politechnika Śląska w Gliwicach**

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## **Rozprawa doktorska**

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### **ZASTOSOWANIE ZASAD TOYOTY DO IDENTYFIKACJI DZIAŁAŃ DOSKONALĄCYCH PROCES PRODUKCYJNY W PRZEDSIĘBIORSTWIE BRANŻY PRZETWÓRSTWA MIĘSNEGO**

Opiekun naukowy:

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## Summary

A dynamic growth of interest in economics and, on its basis, in management was observed as early as the beginning of the 20th century. In this aspect, attempts have been made in various industrial realities and structures to define business management models in a way that makes them adaptable for other actors to achieve the best possible results. One of the leaders in the introduction of new approaches to business management defined in the literature is Japan's Toyota. The methods proposed by the decision-makers and owners, implemented and, one might say, tested in practice, have proved to be successful and have found many imitators. Nowadays, imitators continue to improve the established methods or construct new ones on the basis of Toyota's principles. One of the proposals is the BOST method used in this study, created by Prof. Stanisław Borkowski, PhD DSc.

The research scope of the study focuses on the management of the production process in meat processing enterprises. The main research object (in addition to others analysed in less detail) is a plant producing pork meat in Poland. The meat products market, like other product markets, is subject to competition including international one. Management skills have to be systematically improved, but information about the specific way of behaving in a turbulent environment, for competitive reasons, is not easily available. Owners have to learn and improve on their own, which is why the doctoral student decided to make the effort and expand his knowledge of management skills in meat processing.

The following leading objective has been formulated in the thesis: to identify the importance of factors describing Toyota's management principles and describing the so-called TOYOTA house.

The utilitarian objective of the study was to demonstrate the usefulness of Toyota principles for assessing the performance of meat processing plants in Polish conditions.

The following hypothesis has been formulated in the study: In the conditions of globalisation, taking into account opinions on the high quality of Polish meat and cured meat products from this raw material, thanks to proper cooperation between the producer and livestock suppliers, maintaining a position on the market is supported by opinions of employees at the operational level, used to improve the process in meat plants.

Taking into account the above conditions and premises, research was undertaken pertaining to the transfer of the eastern approach to production in relation to the meat enterprise. A form of this approach constitute the Toyota management principles highlighted in the BOST method. Supporting hypotheses have also been adopted:

1. Cooperation with the environment of a meat processing plant, levelling production and eliminating wastage guarantee the continuity of supplying meat products to the market.
2. The popularity of meat products made from Polish raw material is determined by their quality and the factors that shape it.
3. Practical information on the functioning of processes in a meat processing plant is possessed by its participants.

4. Information on the functioning of the system is used as a basis for decisions to improve processes, taking into account the TOYOTA approach to production.

5. Meat processing plants have varying attitudes towards the importance of factors describing TOYOTA management principles .

The presented dissertation demonstrates the versatility of management solutions. The tools created by entrepreneurs to improve the functioning of the entities they manage, thanks to popularisation and adaptation by others, can - as indicated in the dissertation - also be used in other sectors. Appropriate adaptation using further solutions and developments, which include the BOST method, allows these tools to be used practically – as it can be assumed - in any sector of the economy.

The dissertation, entitled: "The application of Toyota principles to the identification of activities improving production process in a meat processing company", has been written using a survey in the empirical part. The respondents were employees of meat processing plants located in Poland. The research used the BOST questionnaire sheet, which includes a description of Toyota's management principles in questions, a set of which are specific and named areas. Respondents are asked to rank the listed factors according to their value. Before analysing the sets of ratings, the validity of the questionnaire results was assessed, cases where there was a rating outside the scale or the same rating occurred several times were removed. First, the structure of the respondents' characteristics - the independent variable - was assessed. After verifying the initial data, a statistical processing of the obtained sets of evaluations was carried out, as each respondent has the right to express their approach in the evaluation. In this respect, much attention was given to the arithmetic mean, the standard deviation, the skewness of all the elements of the set of assessments and the skewness of 50% of the middle assessments of the set. Next, the relationships between the scores obtained were addressed: importance rating less than another, similar or not to another in terms of preference, significance of the variation between the mean ratings. An important section is the analysis of the relationships between the importance ratings of the factors and the characteristics of the respondents. The results from the BOST survey have been summarised in tables or figures. The data of the tables, figures was subjected to description and analysis, thus obtaining valuable information on the suitability of selected Toyota management principles for process evaluation in the food industry, meat processing industry. The results of the study, presented in the paper, concern 8 meat processing plants, the total number of respondents is 279, while the number of variables: characteristics of respondents 6, number of variants 30, factors 49.

The results of the study, their description and multivariate analysis provide the grounds for the following conclusions:

1. The Kendall concordance coefficient for all sets of assessments ranged from 0.01 to 0.58. Compared to the level of this factor during gymnastics competitions, dance tournaments, this coefficient is very low. However, it should be taken into account that in these cases the evaluation is carried out by qualified persons - judges. As far as the surveys are concerned, these are employees of companies who

do not have the skills, knowledge and practice as the judges, but they make evaluations according to their own scale in their professional activity.

2) In the content of the mission according to Toyota, there are supposed to be five expressions: quality, manufacturing costs, lead time, work safety, crew morale, yet, not all surveyed meat plants have the justification to use them.

3 It has been shown that the factors that do not determine the direction of development and not being in line with the TPS operating philosophy in general are: cooperation with co-operators for most companies, trust in relations with employees and nurturing the company culture for all plants. The research has shown that two of the seven factors - customer wellbeing, product innovation - are significant as a direction for development for all meat plants, while also the two factors eliminating waste and nurturing company culture are not significant in any meat plant's strategic plans.

4. The organisation of processes according to Toyota's principles No.: 2; 3; 4; 6; 7 is supported by factors in the following areas: problem disclosure - continuous system of problem disclosure and use of visual control, avoidance of overproduction - production on customer's "demand", rational use of machines, people, equalisation of workload - even load of employees, even load of machines, standardisation of processes – standardisation of one operation execution time, standardisation of process, types of visual control improving flow - cleanliness/orderliness, participation in production sites.

5) When developing countermeasures to avoid making the same mistake in the future (becoming a learning organisation), according to the hansei philosophy, maximum attention should be given to factors: quality, machine maintenance, and technology portfolio, waste management.

6. The other factors that have not been mentioned cannot be discriminated, although they have a secondary or further role, they are part of the description of Toyota's management principles, a fulfilment, they complement the core activities.

7. The factors relating to machinery described as: rational use of machinery, people, even loading of machinery, maintenance of machinery are at the forefront of the factors, determining the core of the most important activities of meat plants.

8 It has been found that regardless of the level of the average assessment of a given factor in the ranks of the investigated meat plants, the same companies have not been found to be located in the first four places. The identical positioning of the same enterprises ends in the third place. This conclusion confirms the fact of the different importance of the factor in the studied meat plants.

9 The factors concerning the respondents: staff morale from area E1, nurturing the company culture from area E2, and increasing one's own commitment and improving one's own qualifications from area E8 in all companies have the lowest average ratings. This problem in itself calls for tireless reflection (hansei).