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Review report of Ph.D. thesis of Saad Obaid Fayyadh, M.Sc.,
entitled
'Agricultural extension as an adult education: perceptions of farmers and extension agents towards educational and advisory services provided to farmers to achieve food security and food safety'
prepared base on the invitation letter
from the Dean of the Faculty of Agrobioengineering, University of Life Sciences in Lublin,
Professor Krzysztof Kowalczyk, Ph.D., D.Sc. (R.dz.531/os/2016-2017, 18.05.2016)

The reviewed doctoral thesis was prepared in the Department of Shaping the Quality and Standardization of Plant Materials, Chair of Agricultural and Environmental Chemistry, Faculty of Agrobioengineering, University of Life Sciences in Lublin supervised by the known specialist in agricultural chemistry of food quality Prof. Aleksandra Badora Ph.D., D.Sc. The co-supervisor was Dr Jolanta Kozłowska-Strawska, D.Sc. In the research team headed by Prof. Aleksandra Badora, there have been carried out intensive investigations connected with the shaping the quality and standardization of plant materials.

In my opinion, the subject of the doctoral thesis by Saad Obaid Fayyadh, M.Sc. is topical and interesting as well as important from both cognitive and applicative points of view. The doctoral thesis of Saad Obaid Fayyadh, M.Sc., includes 203 pages, 60 tables, 1 map, 51 figures as well as 199 properly chosen reference items of which 138 covers the last 10 years. Moreover, the survey measurements including as many as 140 pages is attached to the Ph.D. thesis.

Lately due to increasing awareness of consumers and the attitude of healthy diet based on high quality products containing the components beneficial for proper functioning of organisms, food free from toxic substances, pesticides, heavy metals, nitrates(V), microbiologically safe, the issues of food safety become of significant importance. One can encounter threats for food safety and negative factors affecting quality in every stage of production, processing and distribution.

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Hence the community decrees and national legal acts impose responsibility for production and trading safe products on each farmer being a contractor of food and feed. These regulations determine hygiene requirements for agriculture products producers. This would not be possible without continuous development of agriculture awareness and proper perception of safe food and food provision by farmers and those responsible for agriculture education. This problem is still essential and topical. Therefore the main aim of the Ph.D. thesis was the analysis of perception of prospects in agriculture quality and safety of agricultural production by farmers and workers of advisory institutions in South-East Poland. Moreover, Saad Obaid Fayyadh, M.Sc. compares agriculture advisory service in Poland and Iraq as for safe agricultural production. He also presents a model promoting development of collaboration between farmers and agricultural institutions as regards assurance of food safety in Poland and also in Iraq.

The doctoral thesis is of a monograph character combining the literature data with the survey research data obtained by the Author. It is composed of 7 chapters (with conclusions and recommendations, references and set of attachments). The paper can be divided into 2 parts. The first is the literature part which introduces to the food security and the second part describes the results of the questionnaire with attachments such as the questionnaire form and comprehensive analysis of the results in the form of tables and figures. All parts are presented in a logical and exhaustive way.

In Chapter 1 main issues and challenges of the contemporary world – increasing population growth, climate changes, food prices growth, conflicts and battles as regards food safety are presented. It was noted that one of the instruments affecting better food security is the agriculture advisory service introduced in Europe at the end of the 19th century which contributed to development of farmers' knowledge and skills in the field of agricultural practices and adopting an active attitude towards innovations in agriculture, sustainable development and environmental protection. This attitude is still topical, especially when Poland joined the European Union accomplishing the Community assumptions. It is not possible to attain great development of agriculture sector without an effective and efficient educational system and agricultural advisory service. Agricultural extension services play an important role in increasing the quality and quantity of agricultural production. Subchapter 1.2 presents the aims of the reviewed Ph.D. thesis.

Chapter 2 being a vast literature survey presents the problems connected with basic terms referring to agricultural advisory service, history of establishment, assumptions and philosophy of agricultural education, and advisory service in both Poland and Iraq and their role in development of agriculture and rural communities.

Information technology revolution and competitive global markets make the whole society acquire the habit of lifelong learning. Market globalization and changes in the employment structure encourage collaboration and communication. Scientific knowledge and techniques develop rapidly. Development of Polish agriculture, its restructuralization and modernization require divers activities connected with education of farmers and other village residents. Continuous development of qualifications within organized education or as courses, seminars, displays, agricultural markets, shows, studio tours, training courses as well as practical placements in well cared farms at home and abroad enhances effectiveness of knowledge transfer into practice, indispensable for productivity growth in this sector. Farming practice handed over from generation to generation even very good one is not sufficient nowadays to achieve such effects as those obtained by new technologies and new knowledge provided by education. As it is pointed out besides the professional knowledge the farmer must possess holistic education. He must be a mechanic and economist, zootechnician etc. and could claim to be a creative manager open to new technologies and farming techniques. Such approach results from never ending education where open and flexible approach to development of knowledge, competences and availability is desirable in all life stages. This takes place every day, is a result of personal needs, assumes a form of education by action and concentration on farmer's realistic problems and priorities.

It should be highlighted that the agricultural advisory systems in Poland and Iraq, described in the Ph.D. thesis by Saad Obaid Fayyadh, M.Sc. are completely different. In Poland the agricultural service system based on the European and national legal regulations, assembles both public (the Agricultural Advisory Centre with divisions and Provincial Advisory Centres) and non-public institutions. Besides the public advisory service system, the national regulations give advisory competences to other non-public subjects and organizations such as private advisory services or economic self-government units e.g. Agriculture Chambers. Their fundamental

functions are to help educate efficient, streamline of information among the agricultural market members and assistance in the development of rural households.

In Iraq the general goals of the Department of Agricultural Extension and Training focused on the development of knowledge and skills of farmers and animal breeders by, among others, agricultural programmes, publications, displays, festivals and seminars. However, in the background the absence of an effective strategy for agricultural guidance and training, including decentralization, a lack of curriculum guidance and training for agricultural activities and plans for an effective strategy whether medium or long-term is found. As can be seen the application of farmers education principles and basic methods as well as techniques is indispensable. The basic problems of many national extension systems is their top-down or at times simplified management structure, a lack of adequate financial resources and properly trained staff, poor effectiveness of education and training supported by information technologies and first of all whether farmers are actually interested in learning what is required to be taught. Among the models described there are such agricultural advisory systems as: the Farm Advisory System, the Farmer Field School, the Cooperative Extension System and the Participatory Extension Approach. Saad Obaid Fayyadh, M.Sc. has also comprehensively discussed the issues related to the acquisition of knowledge by farmers, developing interest in given problems, including internal and external motivations (benefits from participation in learning), with accompanying fears as well as positive or negative consequences. The education system implies not only action during the formal education as a systematic, organized education model, structured and administered according to a given set of laws and norms, presenting a rather rigid curriculum as regards objectives, content and methodology, non-formal education as institutionally organised beyond educational and training programmes which does not lead directly to the attainment of a registered qualification as well as informal education which does not correspond to an organized and systematic view of education and does not necessarily include the objectives and subjects usually encompassed by the traditional curricula that is the process of the attainment of knowledge, skills and social competence through a wide range of activities occurring outside the organised forms of learning. The assumptions of those above mentioned systems have been discussed in detail.

It was also pointed out that leaders in the field of agricultural education are responsible for the synthesis of technical information, planning programs that will help solve energy and productivity problems being consistent with global trends in agriculture. In turn, in the group of the challenges to improve agricultural education the following must be taken into account: well-educated human resources especially those with clear insight into agriculture-related disciplines, such as agricultural economics, agri-business, marketing management, rural sociology, agricultural anthropology, agricultural ethics and politics, development of a mechanism for the timely updating of agricultural education curricula, intensifying the linkage of advice to the market, introduction of proper understanding and interest in extension education, need to establish mutual linkages between extension education, continuing education, non-formal education, distance education and vocational education, the market ability of the process and products of agricultural education, growth of complete autonomy of agricultural universities, coupled with accountability, to ensure academic excellence and first of all the failure to consider agriculture as a profession enjoying a high level of social trust or social advancement.

Another very important aspect dealt with in Chapter 2 are the issues of food security, regular access to sufficient amounts of safe food to meet nutritional needs and preferences, enabling an active and healthy lifestyle. This requires multidimensional policies, including development of sustainable agriculture, processing and trade, provision of financial assistance to disadvantaged groups and fight against malnutrition. Special attention was paid to the arable lands. As follows from the literature data, about 61% of the arable lands is being actually used in Poland which indicates that there are large areas of arable land still untapped. Many of them, especially in Upper Silesia, are contaminated with heavy metals and have very low pH values. The issue of climate change, rainfall, plant and animal production and, above all, employment in this sector are also important. The analogous analysis was carried out for Iraq. However, in this case there were discussed such important issues as location of agricultural land, soil salinity, soil pH value, microorganisms abundance, a shortage of irrigation water in summer, drought and unstable political situation. All these factors are specific obstacles that prevent the development of the agricultural sector and lead to self-sufficiency failure.

Access to a sufficient amount of safe and nutritious food is crucial to the well-being of all people. Addressing the aspect of food security in this chapter, Saad Obaid Fayyadh, M.Sc., mentions such factors as: biodiversity and soil functionality, macro- and micronutrients content, stability of water relations, quality and availability of water, climate change, sustainable management of soils with the goal of improving productivity such as agro ecology, conservation agriculture, organic farming, zero tillage farming and agroforestry. Proper fertilization increases amount of crops, improves crop yields and soil fertility without causing negative environmental effects. Clean soil and high-quality crops contribute to human and animals health.

Chapter 3 discusses the methods and procedures used to achieve the assumed goals. It consists of sections covering the methods and description of the research design. The chapter was organised under the sections used to accomplish the purposes of the study: description of the study area, data collection procedure, elaboration of the questionnaire, data analysis and the presentation of all research objectives. The study included both the measurement of intangible assets (perception) and material resources (demographics of farmers, scope of work of advisory institutions). 89 respondents including 68 farmers and 21 extension agents from the Lubelskie and Podkarpackie provinces participated in the study. Each group received a different type of questionnaire. The first questionnaire concerned the farmers perception of food safety education and advisory services. It consisted of five blocks within with profiles of farmers and their farms, quality and safety of agricultural production, benefits of the educational and advisory services, evaluations of the performance of the institutions, or the opinions of the farmers as for the future of agriculture in Poland were analyzed. The second questionnaire was about extension of agents' perceptions of the educational and advisory services involved in achieving food security and consisted of four blocks, containing 23 items such as: the scope of the institutions' work, activities of the institutions in respect of the farmers, evaluations of the performance of the institutions, opinions of the extension agents as for the future of agriculture in Poland. Five-point and seven-point Likert scales as well as open-ended and closed-ended questions were used for the analysis of the data by the Ph.D. Student. For each area the appropriate statistical methods were matched and demonstrated the ability to the effective use of these methods.

Chapter 4. Results and discussion - this is a detailed analysis of the results of the survey. It covers nearly 80 pages of the thesis and together with Chapter 7 which covers about 140 pages (survey form and comprehensive analysis of the results in the form of tables and figures) constitutes an inseparable whole. Chapter 5 is a summary of the achieved results in the form of conclusions and recommendations. Chapter 6 includes the references.

The Ph.D. thesis has been written in a proper language. Individual chapters and subchaters follow logically which indicates that its arrangement was carefully thought over. The research results are presented in an orderly, compact and communicative way and their discussion is substantial and complete. Formal presentation of the results in the form of tables and graphs does not raise any objections, and subsections in which the discussion of the results is presented prove that the research objectives are consistent. It can be seen that Saad Obaid Fayyadh, M.Sc. did a lot of work and made a great effort to write the paper. He collected large survey material and its elaboration required a lot of patience, accuracy and diligence.

Every issue was analyzed in detail, which was also related to having a large amount of knowledge as reflected in the wide-ranging literature part of the thesis. The conclusions drawn from the analysis of the questionnaire should be particularly pointed out to. They are formulated in a logical way, cognitive aspects are properly emphasized and the discussion does not raise any objections. Comprehensive analysis of the results of the survey conducted by Saad Obaid Fayyadh, M.Sc. became the basis for proposing a model and recommendations of the scope and scenarios of food safety activities. In my opinion, it is one of the most important achievements.

Referring to aims of the doctoral thesis, I have detailed remarks and questions:

1) Where the surveys representative survey? If so, on what basis have they been selected? The same question applies to agricultural agencies, agricultural advisory centres.

2) To make the results of investigations reliable after generalization and fully satisfying the need of information there should be determined possibilities of inferences about the whole population, estimation of fate errors and take advantage of canons of sample numerical force determination. Could this type of generalizations be carried out in the agricultural areas in other parts of Poland?

3) What are specific challenges for agricultural advisory institutions in terms of the specificity of agriculture in the south-eastern provinces (with low income and less integrated with the

institutional environment, with the respect to finances or market compared to other regions of Poland)?

4) What factors can influence further growth and improve the quality of relations with agricultural advisory units in relation to farm holdings (enlargement of agricultural areas, machinery park, introduction of innovations, etc.), market relations (organization and stabilization of the market for agricultural products, promotion of activities and ecological products, etc.) or food security?

5) As follows from the literature data the advisory service is not a main source of farmers' knowledge. They acquire it also from professional press, the Internet and television, training courses and modern software assisting agricultural activities. According to the investigations as many as 86% farms in Poland make use of the Internet and 71% makes decisions e.g. purchasing based on it. How should the prospect of introducing IT solutions in relation to food security be addressed in the aspect of Ph.D. studies? What actions can you propose to activate this area?

Summing up, it should be stated that Saad Obaid Fayyadh, M.Sc. mastered a number of statistical methods, carried out investigations on a wide scale and obtained novel results of both cognitive and applicative character. However, I would like to point out to some drawbacks or controversial statements which is unavoidable in such comprehensive paper. Some of them I would like to mention as examples:

Page 37 repeated title of Table 37 (*Percentage distribution of extension agents' perceptions based on their opinions about the basis of choice of activities and programs implemented for farmers)*

Page 46 the explanation of the abbreviation of 'ICT' should be added in the text, it appears on page 67

Page 51 as follows from the context of the sentence *trialability* should be replaced by *triability*

Page 61 the sentence *Considerations for improving agricultural education* was not finished

Page 73 in the sentence *Soil also suffers from deficiencies in magnesium, selenium, calcium, phosphorus, potassium, and many microelements, Se, Mo, and others* the element selenium is used twice

Page 76 *oily* should be changed to *oil*

Page 78 index should be used in *km2*

The name of the south-east region of Poland should be standardized. In the text it is written: south-east Poland, South-East Poland, Southeast Poland etc.

The remaining ones are indicated directly in the text. However, these drawbacks do not depreciate high substantial value of the thesis. The Ph.D. thesis by Saad Obaid Fayyadh, M.Sc. should be evaluated with respect to applicability of the results which along with the presented interpretation and broad viewed perspectives will contribute to further development of agricultural advisory service.

In my opinion the Ph.D. thesis of Saad Obaid Fayyadh M.Sc. is of high quality and constitutes a valuable contribution to the development of food security issues. The Author has obtained important and original results. It should be stressed that Saad Obaid Fayyadh M.Sc. is a co-author of 5 scientific papers published in international journals (The Iraqi Journal of Agricultural Sciences – 2 papers, Journal of Karbala for Agricultural Sciences – 1 paper, European Academic Research – 2 papers) and the conference proceedings (S.O. Fayyadh, A. Badora, Advisory services and agricultural possibilities to achieve food security in Iraq and in Poland. 5th International conference for young researchers, University of Agriculture in Krakow, 16-17 April 2016, Poland). The next one will probably appear soon. In most of the above-mentioned papers, Saad Obaid Fayyadh M.Sc. is the first author.

All in all, the reviewed paper satisfies the requirements for such works accordingly to the Journal of Laws of the Republic of Poland No. 65, Statue 595 of 14 March 2003 about scientific degrees as well as degrees and title in art. Taking the above into consideration I apply to the Committee of Agrobioengineering for acceptance of the Ph.D. thesis submitted by Saad Obaid Fayyadh M.Sc. and admission to further stages of doctoral procedure. At the same time highly evaluating the Ph.D. thesis I propose to award it with a special prize.