

Economics of Total Quality Management of Some Food Processing Projects in Egypt

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Summary

The industry is one of the main pillars of the economic and social development process, whether in developed or developing countries. The industrial sector has a very important role in the Egyptian economy, where industry, especially food processing, plays a major role in providing job opportunities that help reduce unemployment problems. Food processing is one of the most important agricultural industries, with a value of about 147.3 billion pounds represent 66.8% of the total value of agricultural production, representing 20.8% of the total value of industrial production in 2015. The value of food exports amounted to about 2.7 billion dollars in 2017.

The problem of the study is that there is a large part of the food products produced in Egypt that does not meet the standard quality standards. This has negatively affected food safety, consumer health the environment, in addition to hindering Egyptian exports from competition in international markets due to their lack of conformity with international quality standards.

Therefore, the study aimed to study and analyze the economics of applying TQM and food safety in the projects of processing and drying of agricultural crops in Fayoum and Beni-Suef governorates through a set of sub-objectives:

To study the current status of the food processing structure in Egypt, and to identify the current status of some food processing projects in Fayoum and Beni-Suef governorates, and study the production capacity, costs and revenues of some processing and drying projects of agricultural crops, and study the impact of using the TQM system to support economic efficiency and competitiveness in local and international markets, And study obstacles and proposals to expand the application of TQM to some projects of drying and processing of agricultural crops.

The study was based on the use of descriptive and quantitative economic analysis methods to measure the impact of the application of TQM on productivity and increase the competitiveness of drying projects of agricultural crops under study.

For data sources, the study relied on two sources of data:

Firstly: Secondary data published and unpublished, obtained from different agencies such as the Central Agency for Public Mobilization and Statistics, the General Organization for Export and Import Control, Fayoum Governorate General Office, as well as studies, research, references and reports websites related to the study subject.

Secondly: Preliminary data obtained through the interview of the managers (or other) of some projects of drying and processing of agricultural crops and designed a questionnaire form containing a set of questions that meet the objectives of the study.

The first section is also the reference review of some previous studies on the subject of management and economics of total quality, in order to identify the most important studies that have been interested in the application of TQM, and to identify its role in increasing the Efficiency productivity and competitiveness.

The second section includes the current situation of food processing in Egypt through the number of industrial establishments. The number of industrial establishments in the public sector is about 408 establishments in 2011, 413 establishments in 2015 and an increase of 1.2%, with an average of 409 establishments at the level of the governorates. The governorates of the Republic reached 8,826 establishments in 2011, and the lowest in the year 2015 is about 8272 establishments with an average of 8398 and the number of workers in the industrial establishments. The maximum number of employees

in 2011 is 270 thousand workers, and the lowest in 2015 is 261 thousand workers, a decrease of 3.75%.

The number of employees in the private sector reached about 749 thousand in 2011, the highest in 2015 was about 751 thousand workers, an average of 754 thousand workers, and the value of production for various industrial activities. It is clear that the highest activity in terms of production value is the activity of coke oven products, refined petroleum products and fuel Followed by the activity of foodstuffs, metal products, machinery, equipment except transport equipment, basic chemicals and artificial fibers, with an average of about 94.1, 10.6, 10.1 and 8.5 million pounds, respectively,

The number of industrial activities projects. It is clear that the highest industrial activities in terms of the number of establishments are the activity of the food industry, the manufacture of non-metallic mineral products, the textile industry, the garment industry, the manufacture of the formed metals except machinery and equipment, the manufacture of materials and chemical products with an average of about 983, 258, 237, 171, 154 and 137 establishment and the number of employment in industrial activities. It is clear that the highest industrial activities in the number of workers are the activity of the food products industry, the textile industry, the non-metallic mineral products industry, the garment industry, the manufacture of materials and chemical products, 36, 27, 21 thousand workers, quantity and value of available energy, actual production and idle capacity of food processing activities, in addition to quantity and value of exports and imports of various food industries.

The second section also deals with the features and indicators of the industrial establishments in Fayoum and Beni-Suef governorates. The number of industrial establishments in the area of Kom-Oshim in Fayoum governorate

reached 228 in 2007, and in 2017 there were 224 establishments with an average of 237 establishments. The number of food processing facilities in the Koum-Oshim area in Fayoum governorate reached 71 in 2007, and in 2017 it was about 36 establishments with an average of 55 establishments, And the number of established The industrial activities in the area of Bayad El Arab in Beni Suef governorate was about 60 establishments in 2017. It is also evident that the highest industrial activities in terms of the number of industrial establishments are the activity of the food industry, with about 16 establishments representing 26.67% of the total number of industrial establishments. Industrial establishments for food industries in Bayad Al Arab area in Beni Suef governorate reached about 16 establishments in 2017.

The third section deals with the economic indicators of some food processing projects in Fayoum and Beni-Suef governorates through the production capacity, costs and revenues of some of the processing and drying projects of agricultural crops under study.

The sample included the processing and drying of agricultural crops in Koum-Oshim industrial zone in Fayoum, The results of the study of the relative importance of the cost items for the projects of processing and drying of medicinal and aromatic plants and vegetable crops that the costs of production inputs are at the top of the cost items.

The rate of fennel production is 85.15% of the total cost in the projects that apply the quality. The percentage of the fennel product in the projects that do not apply the quality system is about 90.75% of the total cost and the percentage of the total production cost in the projects that applied the quality system is 87.81% of the total costs. In the case of non-applying the quality projects, the percentage of the hibiscus product is 94.69% of the total costs. The percentage of peppermint production is 82.21% of the total cost in the projects that implement the quality system, and the percentage of the projects

that do not apply the quality system of the mint product is about 94.42% of the total costs. The percentage of the total costs in the projects that apply the quality system is 80.61% of the total.

The percentage of the projects that do not apply the quality system of the product is about 93.73% of the total costs. The percentage of the parsley product is 82.37% of the total cost projects that implement the quality system. In projects that do not apply the quality system of the parsley product, it accounts for 95.77% of the total cost. The percentage of each of the product of basil, chamomile and karawia about 80.13%, 92.28%, 84.30%, respectively of the total costs in projects that implement the quality system. For each of the anise, dill and celery products, about 88.77%, 93.20% and 87.03% respectively of total costs in the projects applying the quality system.

The percentage of onions and garlic dried products is 92.42% and 92.84%, respectively, of total costs in the projects that apply the quality system, and the percentage of the product of leeks, beans and Molukhia is 92.12%, 83% 93%, 96.85%, respectively, of the total cost of projects that implement the quality system, that refers to the high cost of the raw material used in production.

The results of the study of the relative importance of revenue items in the projects of drying and processing of medical and aromatic plants, which apply the quality system, showed that the yield increased in the product of chamomile, which is about 115,500 thousand pounds, followed by an anise product with an estimated revenue of LE 77,500 and followed by the hibiscus is valued at 73,500 thousand pounds. As for the projects that do not apply the quality system, the yield in the product of the hibiscus increased by about 69,700 thousand pounds, followed by the product of the fennel about 36,500 thousand pounds. As for the revenue items in the vegetables processing and drying projects (the quality system is applied), the yield was increased in the

product of the Molukhia, estimated at 87,000 pounds, followed by the dried garlic product at 62,000 pounds, followed by the dried onion product at LE 6,000 thousand.

The fourth section deals with the economic efficiency of the projects of processing and drying agricultural crops in Fayoum and Beni-Suef governorates, through some economic indicators of the most important products of the projects under study. It also deals with the analysis of the cost of quality and the most important problems and proposals from the point of view of the producers.

In the study of the economic efficiency of some projects of processing and drying of medical and aromatic plants which apply the quality system, it was found that the most products to increase the net profit of the tone product is about 84.057 thousand pounds, and the percentage of variable costs / total revenue in the product of dill rose by 65.77% The yield of the finely fined fennel is 2.77 pounds.

The projects of processing and drying of medicinal and aromatic plants which do not apply the quality system, it was found that the most products of net profit for the ton of the product of the hibiscus, which is about 35.015 thousand pounds, and the percentage of variable costs / total revenue in the product rose 89.97% The product of the fennel is 1.30 pounds.

In the study of the economic efficiency of some of the projects for processing and drying vegetable crops, which applies the quality system, showed that the highest products for the net profit per ton were the product of Molukhia, which amounted to about 55,845 thousand pounds. The variable cost / The total yield of shallot was 55.40%. The yield of the finely chopped dried onion product increased to 3 pounds.

The results of the study of the relative importance of the cost of some of the projects for the processing and drying of medicinal and aromatic plants showed that they increased in the parsley product, estimated at about 1929 pounds of the total cost of the ton, while the cost of quality increased for the leek product, estimated at LE 802.

In terms of the relative distribution of the average cost of some of the projects for the processing and drying of medical and aromatic plants, it was found that the costs of prevention represent about 55.84% from total Conformity costs. For evaluation costs, it represents about 44.16% of the total cost of conformity. The internal failure costs represent about 56.33% of the total cost of non-conformity. , And the cost of external failure accounted for 43.67% of the total cost of non-conformance. For hidden costs of quality, the highest cost is the cost of software changes due to poor quality, the excess process which includes change coverage and the production of an acceptable product of 15.98% each one.

As for the relative distribution of the average cost of quality in the vegetable processing and drying projects, it is found that the cost of prevention represents about 62.01% of the total cost of conformity. For evaluation costs, it represents about 37.99% of the total cost of conformity. And the cost of external failure accounted for 50.78% of the total cost of non-conformance. The cost of external failure accounted for 49.22% of the total cost of nonconformity. For hidden costs of quality, the highest cost is the excess process, which includes change coverage and the production of an acceptable product of 26.28%.

In the study of the economic efficiency of the raw material costs for the projects of processing and drying of medical and aromatic plants, which apply the quality system in case of stability of yield to capacity, it was found to be about 100% in both fennel and basil product, thus achieving the full

comparative efficiency (efficiency index equals 1) for both producers. The study of the economic efficiency of the cost of raw material for the projects of processing and drying of medicinal and aromatic plants, which applies the quality system in case of change in yield to capacity, was found to be about 100% in the product of fennel, hibiscus, basil, chamomile, dill and celery. Thus, full relative efficiency (efficiency index of 1) was achieved.

In estimating the economic efficiency of the other costs of the medical and aromatic plants processing and drying projects, which apply the quality system in the case of stability of yield to capacity, it was found to be about 100% in each of the product of chamomile, parsley and dill, and thus achieved full comparative efficiency. The study of the economic efficiency of other costs in the projects of processing and drying of medicinal and aromatic plants, which apply the quality system in the case of change in yield to capacity, it is about 100% in each of the product of chamomile, anise, parsley, dill and celery.

In estimating the economic efficiency of the cost of quality in the projects of processing and drying of medical and aromatic plants, which apply the quality system in case of stability of yield to capacity, it was found to be about 100% in the product of chamomile, dill and celery, and thus achieved full relative efficiency, and for estimating the economic efficiency of quality costs in processing projects and the drying of medicinal and aromatic plants which apply the quality system in case of change in yield to capacity, it turns out that it is about 100% in each of the product of chamomile, anise, dill and celery.

As for the estimation of the economic efficiency of the raw material costs in the projects of processing and drying of medical and aromatic plants which do not apply the quality system in case of stability of return of

capacity, it was found to be about 100% in both fennel and parsley . Thus, full relative efficiency (efficiency index of 1) was achieved.

In estimating the economic efficiency of the other costs in the projects of processing and drying of medical and aromatic plants which do not apply the quality system in the case of stability of yield to capacity, it was found to be about 100% in both the product of the hibiscus and parsley, and when estimating the economic efficiency of other costs in the projects of processing and drying medicinal and aromatic plants Which does not apply the quality system in case of change in yield to capacity, it turns out that it is about 100% in both the product of hibiscus and parsley.

In the study of the economic efficiency of the cost of raw material in some projects of drying vegetable crops, which apply the quality system in the case of stability of yield to capacity, it was found to be about 100% in each of the product of dried onions and balls and Molukhia, and when estimating the economic efficiency of the costs of raw material in some projects of drying vegetable crops Which applies the quality system in case of change in yield to capacity, it turns out to be about 100% in each product of dried onion, dried garlic, leeks, beans, and Molukhia.

In estimating the economic efficiency of the other costs in some projects of drying vegetable crops which do apply the quality system in the case of stability of yield to capacity, it was found to be about 100% in both the product of the dried onion and Molukhia, and when estimating the economic efficiency of other costs in the projects of drying vegetable crops which does apply the quality system in case of change in yield to capacity, it turns out that it is about 100% in both the product of dried onion, dried garlic, leeks and Molukhia.

For estimating the economic efficiency of the cost of quality in some of the projects of drying vegetable crops, which apply the quality system in the case of stability of return to capacity (CRS), it was found to be about 100% in the product of dried onions and Molukhia. For the estimation of the economic efficiency of the cost of quality in some projects of drying vegetable crops, which apply the quality system in case of change in yield to capacity (VRS), it was found to be about 100% in each of the product of dried onions, dried garlic, leeks and Molukhia.

The rate of economic efficiency in the stability of return on the capacity of the cost of raw material 100% in both fennel and mint, in the projects that implement the quality system, and the economic efficiency of the fennel product is about 77% in projects that do not apply the quality system, volume yields are increasing. The percentage of the mint product is about 80% in projects that do not apply the quality system, and the volume yield is increasing. . The rate of economic efficiency in the change in return on capacity for the cost of raw material was 100% in all fennel, mint, hibiscus and parsley, in projects that implement the quality system.

For projects that do not apply the quality system, the economic efficiency ratio in the model of change in return on capacity for the raw material costs of the fennel product is about 79%. Consequently, full efficiency was not achieved, and its percentage in the mint product about 80%, and therefore did not achieve full efficiency.

The study also found that the most important financial problems faced by producers applied to the quality system are the high cost of 100% of the total producers of the sample. The most important technical problems are the high margin of marketing by 100%, while the administrative and legal problems are the most important laws for import and export by 70%, and for

information problems, the most important of which is the lack of sufficient information about competitors by 70%.

The study found that the most important financial problems faced by producers that are not applied to the quality system are the high cost, high taxes and fees by 100% each of the total producers of the sample. The most important technical problems are the high margins of marketing, the decline in the quality of raw materials, the lack of skilled labor and the lack of adequate services in the industrial area by 100% each. The administrative and legal problems are the most important change laws on a continuous basis by 75%. The information problems are the most important in the absence of an information system, and the complexity of procedures to obtain commercial and industrial records by 100% each.

