

FACTORS AFFECTING HACCP TRAINING SUCCESS RATE AND ITS IMPACT AMONG KINDERGARTENS EMPLOYEES

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Abstract

According Food Safety Law (Official gazette of Republic of Macedonia No 54/02, 84/07 and 157/10) [1], [2] and [3] all food producers and operators have to implement and maintain HACCP system. Republic of Macedonia Ministry of labor and welfare awarded Consulting & Training Centre - KEY to train all employees dealing with food in the kindergartens in whole country, in total 120 people from 58 institutions. The purpose of the training was to enable food operators to implement, maintain and modify HACCP in their kindergartens on their own. At the end all participants were tested and filled in evaluation grids.

The main purposes of this research were to establish:

- The educational background of kindergarten employees dealing with food, their age, job description, regional distribution and by cities and
- The impact of the training structure and organization on the increased level of knowledge to implement HACCP system

Based on the tests and evaluation form, the conclusion is that training success rate was mostly influenced by: age, level and type of background education, previous information about the HACCP system, development of the regions, training structure and participants' preparedness to learn.

Key words: HACCP training, kindergartens, training impact.

1. Introduction

HACCP (Hazard Analysis Critical Control Point) is preventive system that obtains production of safe food, based on logical implementation of technical and scientific principals in the production process: from primary production, preparation and handling of food, processing and distribution, etc. Accordingly

the responsibility is primarily on the people working directly with food.

State kindergartens and social public institutions in the Republic of Macedonia are also in this category of operators preparing and dealing with food. That is why they should also have relevant information and be able to detect possible food safety problems.

The main purpose of this project was to train HACCP team (of two employees) to establish and maintain the system on their own. Than this team should involve all participants in that process of food production and handling and educate them how to implement, maintain and modify HACCP in their kindergartens and social institutions.

2. Materials and Methods

Team of two trainers with extensive theoretical and practical experience in the food safety field prepared the curriculum and guide for 3 days training, based on the general HACCP model by Codex Alimentarius. Each training had interactive exercises where participants were asked to prepare, present and discuss different phases of HACCP plan preparation and HACCP system implementation.

At least 2 representatives from all 51 state kindergartens and 7 social public institutions were trained. Within duration of 3 months, in total 120 employees were included in this process. The 10 training workshops were organized locally, in 6 regional centres: Skopje, Kicevo, Prilep, Kocani, Stip and Strumica, in groups of 7 to 20 people. All included institutions from nearest towns in one region were no more than 100 m away from the training facilities.

At the end of each training, participants were tested (23 questions) with multiple choices, during 60 minutes. After that they filled evaluation forms (7

questions) about the overall organization (facilities, food, hospitability of the organizer), training content, materials and trainers. The data were processed statistically, calculated as arithmetic middle values, and expressed in absolute numbers and percentages.

After performing all trainings Consulting & Training Centre KEY submitted the Final Report - Training for implementation, maintenance and modification of HACCP in state kindergartens and social institutions in the Republic of Macedonia [4] to the Ministry of labour and welfare.

3. Results and discussion

3.1 Analyses of the trainees' structure

▪ Trainees by position

Each HACCP team should be multidisciplinary and can include different personnel (from production, accompanying personnel, quality control staff etc). It is highly recommendable representatives from the management staff to be in the HACCP team, especially when financial decision must be made for renovations before starting to implement HACCP system.

The Ministry for labor and welfare selected the training participants as follows: 69 chefs, 21 auxiliary chefs, 17 dishwashers, 6 nurses, 4 suppliers, 1 children social worker, 1 administrator, and 1 director.

The most of the trainees were chefs (69+21) in total 107 employees. If we can take in consideration that chiefs, auxiliary chiefs and dishwashers are the employees directly involved in food preparation, the conclusion is that the first goal was realized: to be trained people who are directly handling food and understanding the technology and equipment used in the production process, practical aspects of operations for production etc.

In total 13 employees - accompanying staff were trained, people directly responsible for the children health and hygiene, as well as sanitation and use of non-food chemicals. It is always good to have this category of employees involved in the HACCP implementation process because they have applied knowledge for food microbiology.

The number of suppliers is relatively low (4) compared with other categories and this is something that has to be corrected in the future. These employees are responsible for purchasing and storage of food and other materials and food raw materials, as well as materials for sanitation and hygiene maintenance and non-food chemicals, extremely important for food safety.

The number of management staff is significantly low (1). These people are responsible for the financial

implications due to HACCP implementation and maintenance. They are usually involved as members of the committees for procurement of food and food equipment that is why their understanding of the HACCP system in their institutions is essential. Suggestion: more people from the management of these institutions to be trained additionally.

▪ Trainees by educational background

Generally speaking the biggest number of trainees (113) was with high school background, particularly caterers. This educational background is expected and desirable in the kindergarten kitchens especially for chefs and auxiliary chefs who have good knowledge of food preparation, storage of food and food raw materials, as well as the producing process, very important for HACCP implementation.

When speaking about the educational background in one HACCP team the minimal level of education should be secondary school education. It doesn't exclude people with only primary school education because in the HACCP team all hierarchy levels should be included. In this case people with primary school background were usually the dish washers (17), directly working in the kitchen. Their input in the whole process of HACCP implementation is crucial and that is why they should be more present in the HACCP teams and trained how to maintain the standard daily procedures during sanitation of equipment and dishes.

Only one trainee was with university education (the director). This level of education is also highly recommendable in the HACCP team in each institution, especially in the field of natural science (agriculture, veterinary, medicine, mathematics and sciences, technology and metallurgy, etc).

3.2 Results from testing

▪ Success rate of trainees by regional distribution

In accordance with the results from the tests the best success rate was found among trainees in Skopje region with 79,67 %. Second was Prilep with 77,1 % and third Stip with 72,61%. The other three regions we also successful taking in consideration that minimal success level was 60%. They were going from 61,59 % in Kocani, 65,25 % in Kicevo to 69,67 % in Strumica.

Regarding Skopje region success rate we should have in mind that this percentage is calculated as an arithmetic middle value from five (5) training groups and that is why we should look at the success rate of each group separately. We can see that there are three groups in Skopje with very high percentages from 88,88 % till 91,55 %. And the other two with very low results from 61,5 % till 66,45%. Although the last

two groups had trainees with only primary school education the lowest results on the tests were done by trainees with secondary school educational. We have discovered this in Kocani and Kicevo region, too.

▪ Success rate of trainees within regional centres

Looking at the situation by each state kindergarten and public institution within **Skopje regional centre** the results were very different. They varied from 60,87 % till 96,95 %. The results from the kindergartens in two additional towns included in this region Tetovo (64,78%) and in Kumanovo (73, 9%) were below the average rate of this region. Interesting fact is that 7 from 23 kindergartens had success rate over 90% and 6 over 80% which speaks about the high preparedness of the trainees to implement HACCP system in their institutions. Only 7 institutions had success rate below 70%.

Kicevo regional centre also included kindergartens from Debar, Struga, Ohrid, Gostivar and Makedonski Brod. The best results were in Ohrid (72,17%) and the lowest although successful in Kicevo (60, 86%). Generally speaking most of the institutions were below 70%. This is a result of several factors: age before retiring, not interested to lean and gain new knowledge, transfers of responsibility on others, etc.

Prilep regional centre as a second best region included the following towns: Bitola, Kavadarci, Resen, Krusevo and Demir Hisar. Only the kindergarten from Kavadarci had rate below 70%, 5 from 70%- 80%, and 3 over 80%. Trainees from this region were confident that they can start immediately with HACCP implementation in their institutions, asking very specific questions during the HACCP plan preparation.

Strumica regional centre was one of the average success regions. With 3 kindergartens under and 3 over 70% these trainees although with secondary school background showed average level of interest.

Stip regional centre is interesting because the kindergarten with the highest success rate comes from Radovis and with lowest (67,38%) from Stip. The other two towns Sveti Nikole (69,56%) and Veles (73, 91) were around the average. The best results were shown by the chief and dish washer and not by a chief and nurse.

Regional centre Kocani had the lowest results of all. The best and the worst kindergartens were all below 70% percent success rate. Several problems were evident in this region: there is no enough information about HACCP system in this region, they were old and not interested for new knowledge, not excepting additional responsibility, etc.

▪ Success rate of trainees within towns

When we look at the success rate by towns it is obvious that the size of the town is not decisive for the results but how much people are interested to learn and their willingness to implement HACCP system in their institutions. Hence Skopje had the best results followed by Radovis, Prilep, Krusevo, Bitola and Negotino.

▪ Success rate by educational background

The analyses led to interesting conclusions: although the rate was highest among the secondary school trainees (79,70%) those who were directly involved in the food preparation process (chiefs, auxiliary chiefs and dish washers) had higher results than accompanying staff (administration, nurses, director) because they were familiar with each and every operation in details.

▪ Total success rate

From the total number of 58 institutions, almost half of them 28 were with results from 60-70%. That leads to the following conclusions: trainings should continue in the future, all other employees should be informed more about the HACCP system, gradually the age structure of the employees should be changed (hiring more young people who are prepared to learn and implement new methods of work).

3.3 Results from Evaluation Grids

After each training all participants were asked to fill the evaluation grid. On 5 questions they were asked to select: bad, good, excellent and on two to answer with YES and NO.

▪ Evaluation of the trainers

The trainers were awarded with excellent 100% which means that all participants gave answer excellent for the 2 trainers, evaluating their presentation skills, interactive approach and willingness to help and share knowledge.

▪ Training content and materials

The training materials were evaluated by 93,4% as excellent and only 6, 9% as good. It is interesting that 1,7% stated that the content of the training is bad. By analyzing these statements we discovered that answers are coming from the people that have passed the tests from second time.

▪ Training facilities and lunch/refreshment

Although 29% answered that the training facilities were good (not excellent) it should be stated that these answers are coming only from the groups in Kocani and Strumica where heating was off few hours in the both hotels.

▪ Overall organization

The overall organization of the training was evaluated as excellent with 93, 4%. No negative answers (bad) were given.

▪ Additional HACCP trainings in the future

All participants (100%) answered YES on the question: do they think further HACCAP trainings are needed.

▪ Future cooperation with Consulting & Training Centre KEY

They have expressed their satisfaction working with Consulting & Training Centre KEY and willingness to continue the cooperation in the 2-nd (prerequisite analysis) and 3-rd phase (HACCP implementation).

4. Conclusions

Following conclusions were made from the performed analyses:

- The Ministry of labour and welfare should continue to take care and give relevant information to these institutions about HACCP system;
- HACCP Training should go on in the future and cover all employees working in direct contact with food, food equipment and chemicals for sanitation and hygiene in all state kindergartens and social institutions on the territory of Macedonia;
- HACCP team should include more then 2 employees involving at least one from the management team;
- Half of the kindergarten (50%) had success rate from 60-70% which is relatively low;
- With most successful rates are the trainees with secondary school background;
- Those who were directly involved in the food preparation process (chiefs, auxiliary chiefs and dish washers) had higher results than accompanying staff (administration, nurses, director);
- The size of the town is not relevant for the score of the trainees;

- The willingness to learn is essential for the good results;
- Age can also be a problem if the person is 2-3 years before retiring. Structure of employees must be changed gradually with young employees;
- More suppliers and management staff should be trained;
- Lower results from testing are due to a lack of information, regional development, not willing to accept responsibility, age and too confident about the knowledge person already has.

5. References

- [1] Food Safety Law (2002). Official gazette of Republic of Macedonia, No. 54/02
- [2] Food Safety Law (2007). Official gazette of Republic of Macedonia, No. 84/07
- [3] Food Safety Law (2010). Official gazette of Republic of Macedonia, No. 157/10
- [4] Final Report - Training for implementation, maintenance and modification of HACCP in state kindergartens and social institutions in the Republic of Macedonia (2010).