FOOD WASTE AT SCHOOLS

What is the most effective way to solve the problem of irresponsible consumption of food at schools?

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**Introduction**

Food waste is an ongoing problem that every developed country faces. In rich countries people throw away a tremendous amount of food each year, while people in undeveloped countries are striving hard to find some food. “Cutting food waste is a delicious way of saving money, helping to feed the world and protect the planet” Tristram Stuart (a UK based Food Waste campaigner who wants to reduce the environmental impact of Food Waste around the world).

This topic was chosen because I have recently seen a video about life of people in Sudan (The New York Times, 2015). There were shown daunting scenes of starving kids whose parents walk dozens of miles from village to the nearest city hoping to find food. Every time I see food thrown on the ground, I think about people in less developed countries that are weak because they do not consume enough nutrition and vitamins. This situation concerns me a lot and I believe that starting with food waste at school will be a great idea as it can reduce the amount of leftovers to some extent.

I probably have a personal bias because I am a student at school and therefore I am directly related to this problem. I may have a subjective viewpoint on the quality of food that is given in the canteen. For instance, I consider dishes to be tasty, however some students could claim that it is not tasty at all. Nevertheless, opinion of the majority of people will be taken into account and objective solution will be found. The research work will perhaps increase awareness of the problem among students in NIS Ust-Kamenogorsk and reduce leftovers. To be precise, main reasons for such a great amount of food waste will be determined and a list of recommendations for school children, nutritionist and cooks basing on the results of survey and project as a whole will be made.

**Context**

Nowadays food waste at schools is one of the most serious concerns that all developed countries face because the immense amount of energy for cultivation, transportation, storage and preparation of food is also wasted and probably the most important is that children do not obtain enough nutrients, proteins and vitamins.

People tend to eat much less of their food and they are more likely to throw it away even though the food is edible (Davenport, Qi, Roe, 2019). For instance, people who took part in the survey (Roe, 2019) expected to eat 97% of meat, 94% of vegetables, 71% of the fruit and 84% of their dairy products in the refrigerator; however, in fact they consumed merely 50%, 44%, 40% and 42% respectively. It means that about half of what they have bought was thrown away. Basing on statistics of Food and Agriculture Organization of the United Nations (2019), 1.3 billion tons of food (one-third of all food that was produced for consumption) end up in a landfill worldwide. Looking at the problem from economic lens, around the globe about 1.2 trillion dollars are spent to produce food that eventually is thrown away (Siddiqui, 2019). This money could be spent on more important things such as development of public services: putting up new facilities for sport, improving medicine or transport service, erecting new schools, donating to charity organizations, increasing salary of residents and etc.

Regarding public schools in England (national scale), primary schools produce more than 55 thousand tons and secondary schools almost 25 thousand tons of food waste over the period of academic year (Cordingley, Reeve, Stephenson, 2011). The largest part of food waste makes up fruit and vegetables, which accounts for 49% combined in primary schools and 36.4% in secondary schools. The main reasons of the problem may be: large portions of food, some students are not hungry by the meal time, some students are fussy eaters, short period of time for meal (moreover in the majority of western schools students should stay in a long queue and that is why they do not have enough time to eat everything). It can be seen from the data that food waste at school in Great Britain is significant and thorny issue.

According to World Wildlife Fund report (2019), 530 thousand tons of food are wasted annually in USA. According to USDA, prolonging lunch periods from 20 to 30 minutes can reduce leftovers by 30%.

In Asia and the Pacific, the Food and Agriculture Organization has a program to decrease food loss. In the last five years, a Save Food organization was helping Japan to reduce leftovers and increase children’s awareness about this issue by reading numerous lectures and carrying out various training activities. Therefore, the amount of food waste in Japan is less than in other developed countries. (FAO, 2017).

Food waste is not only economic problem, but it also related to environment and society. For instance, for production of food products that are not consumed a great amount of water is spent and about 3.3 billion tons of greenhouse gases are emitted (Smith, 2015). Hence, it contributes to global warming and climate change; it also may have an adverse impact on inhabitants’ health, leading to asthma, problems with respiratory and cardiovascular systems.

Food waste is also social problem since undereating may cause some health problems as children do not consume enough nutrients and vitamins. Some teenagers do not appreciate food and throw it away. It is unfair, because some children in Africa can only dream about it. They barely stand on their feet since they do not have enough energy.

One of the nine inhabitants of the world is starving – about 821 million people according to The State of Food Security and Nutrition in the World (2018). Hunger has risen across the world, thousands of innocent children die because of starvation, millions of people are malnourished and lack nutrients, minerals, vitamins. At the same time, 1.9 billion people are overweight (World Food Day, 2019).

There is lack of information about this issue in Kazakhstan, therefore the problem will be explored locally in NIS Ust-Kamenogorsk. Regarding menu in schools of Kazakhstan, bans on eggs, sausages, cottage cheese, mushrooms, complex (more than four components) salads and salads seasoned with sour cream and mayonnaise were introduced in 2019 (project “School canteens”, 2019).

Taking everything above into account, it is understandable that schools produce a tremendous amount of food waste. In some countries different programs are created so as to cope with this issue and reduce leftovers. It is essential to tackle this problem in Kazakhstan.

**Aims**

The main purpose of the research project is to find out main reasons for immense amount of food waste in schools and ways to deal with this issue and reduce leftovers. It seems that the majority of students do not know about the amount of food thrown away and money wasted on it, hence they may not understand the seriousness of the issue. It can be assumed that one of the most effective ways to solve the problem would be to prolong time intended for meal at school.

Therefore, such objectives will be covered:

* What do children think about food at school canteens (do they like it or not)?
* Do they leave food after the meal? If yes, then why?
* What is done with left food?
* What are some probable solutions to the problem?

The outcomes of the research work are intended to decline food leftovers by making a list of recommendations(brochure) for students, teachers and school administration.

**Methods**

1. Survey

Survey was used in order to find out reasons why some students leave food after having meal in the canteen and get statistical information (quality score of food, the proportion of students that have and do not have enough time to eat, how often students leave food after meal). Therefore, the sample group consisted of 62 students (from different grades) of NIS Ust-Kamenogorsk. Answers helped to understand whether students are satisfied with food in the canteen or not, what changes they would like to see in the canteen. The survey is anonymous so as to get more truthful and reliable results. The main advantages of this method are that it helps to ask a great number of people, it does not take much time to answer all questions and helps to get more suggestion to reduce the amount of leftovers. The main disadvantages are: there are 3 open questions in the survey where people should write dishes they do not like and dishes they would like to see in the canteen, and other suggestions related to meal/ food. Some students could forget some dishes while answering, some students wrote too many products that they dislike.

Survey questions:

1) Estimate the quality of food in the canteen (5-like it.1-dislike it)

2) Do you have enough time to eat in the canteen? Yes/no

3) How often do you leave leftovers in the school? Every day/Often/seldom/never

4) What dishes/ products/ drinks you do not like in the canteen?

5) What dishes/ products/ drinks you would like to see in the canteen?

6) What else would you like to change in the canteen?

2. Interview

Interview with school nutritionist was conducted in order to find out deeper information related to the problem of food waste (answer following questions) and to know how thorny the issue is in the canteen (how much food is left). Answers of nutritionist were essential because they helped to find possible ways to deal with the issue. The drawback of the method is that her answers may not be objective since she is biased.

Questions:

1) How much food is left daily? (what do you think about it/ are you concerned?)

2) What products are usually left?

3) What is done with leftovers?

4) Do you have any suggestions how to reduce leftovers?

5) Can products that students usually leave be changed to some others?

3. Focus group discussion

A focus group discussion was conducted to find out some possible solutions for the problem of food waste and identify advantages and disadvantages of these solutions. Opinions of students were crucial because they helped to get qualitative data: find the best solution which can be suggested to cooks (or maybe administration). 8 students took part in the focus group discussion. 2 of them were from 9th grade and 2 of them were from 10th grade and the rest were from 11th grade. It was planned to ask also 7-8th grades, however they rejected to participate. Among all participants only two people liked the food while others gave scores “3” and under. It was quite hard to find students that are satisfied with dishes in the school. The main disadvantages of the method are that some participants were less active than others and most participants do not like food in the canteen. It means that results are not so reliable. Regarding advantages, qualitative data and some suggestion how to reduce leftovers were obtained.

Questions that were discussed:

What dishes do you like/ dislike?

What dishes you would like to see in our canteen?

What other suggestions do you have to reduce leftovers?

What are the advantages/ disadvantages of these suggestions?

**Results**

62 students of NIS Ust-Kamenogorsk answered the survey.

The average score of quality of food in the school was approximately “3” (Fig.1). It means that the majority of students are not satisfied with the quality of dishes that are given in the canteen.

The next question was related to the amount of time given for meal and most respondents have enough time to eat, however almost one-fifth do not have enough time to have a meal (Fig.2). It means that prolonging time for meal could reduce the amount of leftovers to some extent.

Regarding the next question, only 11.29% of all respondents said that they never leave food after the meal in the schools, which is quite worrying. One-third leave food seldom and the rest – often or even every day(Fig.3). Such a large proportion of students who leave food is related to the taste of food and to the fact that dishes are the same every week.

It was found out that the most common dishes/ products that students do not like are cutlets, pasta, fish. As regards drinks, most students do not like kissel and stewed fruit. However, students would like to see chicken, meat dumplings, sausages, juice, yogurts in the canteen. Moreover, students suggested that more time for meal, better quality of food, better cooking quality and diverse dishes could reduce leftovers.

A focus group discussion was conducted in social network “VK”. The number of participants was 8. The results helped to understand reasons why students do not eat some dishes and drink some beverages. Tea is usually diluted and therefore it is tasteless, sometimes fruits are spoiled or just tasteless, sometimes products are undercooked, kefir is bitter, food ration is poor and so students do not want to eat some dishes anymore. Furthermore, food ration does not take into consideration taste preferences. For instance, some students are vegetarian, some students just hate dairy products and etc., but they have to eat them. In addition, some students consider that menu contains little proteins. All participants concurred that the best way to reduce leftovers will be to change the menu.

An interview with school nutritionist was conducted.

The amount of leftovers and the type of products that are left varies and depends on different factors. For instance, the day of week, weather (when the weather is hot people usually do eat less food), however the exact numbers cannot be announced. The amount of leftovers concerns nutritionist and in order to reduce leftovers some measures were taken. For example, periodically students are given survey about food and according to their answers menu can be slightly changed: most students do not like kissel and kefir, therefore cooks started to give them more rarely.

It was found out that the school concluded an agreement with a particular sole partnership. So all leftovers are packed to labelled containers and given to the sole partnership where food is probably given to cattle.

Kindergartens and schools in Kazakhstan have some bans related to the food.

For example,

* mayonnaise, sour cream, eggs cannot be served as students may get poisoned.
* salads cannot include more than three ingredients.
* fried food is banned; therefore, all cutlets are cooked with steam.

 Many students claim that the given food is always cold, however it cannot be changed since all dishes should be cooked 2 hours before it is served so that it could be tested and if the dishes are not cooked properly they could be cooked again. According to the survey most participants would like to eat more chicken and meat dumplings. Regarding chicken, school plans to include more chicken in the menu. As regards dumplings, cooks cannot cook it in large amounts in a short period of time because they do not have special machine that costs a lot. Some students do not like carrot or fish, however they cannot be excluded from the menu since they are very beneficial for health. Also the majority of people would like to see juice, but it will not be included as it contains a great amount of sugar and dyes.

Regarding vegetarians, there is a different menu for them, but before giving them other dishes students need to go to doctor so that students will get some recommendations how not to damage their health by getting lack of some nutrients, proteins.

Regarding meal time, administration do not prolong time because usually canteen is almost empty after 10-15 minutes since the beginning of lunch.

The quality of food is high in the canteen because all products are tested before serving. Moreover, Sanitary and Epidemiological Service, independent laboratory, administration of school and few parents periodically come and test the quality of food.

It is clear that it is difficult to change menu because of some bans, but overall the food in the canteen is quite quality.

**Conclusion**

The hypothesis stated that the best way to reduce leftovers in the school is to change the menu or prolong time for meal. After conducting research, it is clear that results partially support the hypothesis.

* What do children think about food at school canteens (do they like it or not)?
* Do they leave food after the meal? If yes, then why?

While conducting primary research (survey) it was found out that the majority of participants are not satisfied with food in the canteen. However, it is hard to make changes in the menu because of some bans related to food (no eggs, sour cream, fried food, salads with more than 4 ingredients). This information was gained using interview with school nutritionist and secondary research.

* What is done with left food?

Leftovers are packed and sent to sole partnership. Left food is probably used to feed cattle. (data from interview). Therefore, it does not pollute environment. However, a great deal of allocated to school money is wasted.

* What are some probable solutions to the problem?

The most effective way is probably prolonging time for meal so that all students will have enough time to eat (data from secondary research and survey). According to USDA, prolonging time from 20 to 30 minutes can cut the amount of leftovers by 30%. According to secondary research, increasing awareness of the problem and its effect on environment among students may also reduce leftovers.

Even though the sample in survey was about 10% the results may be generalized up to the NIS Oskemen because students from different grades took part in it. However, the extent of generalization is quite low due to the small sample. Regarding focus group discussion, the validity is not high since the most participants did not like food in the canteen. The validity of interview is medium because the nutritionist can be biased as it is her work to control what food is given and monitor the amount of left food. However, she gave detailed information on all questions and fully explained why they cannot change the menu.

Statistics approximately “one-third of all food that was produced for consumption end up in a landfill worldwide” was shocking as it is hard to realize that the scale is so immense. (secondary research)

**Evaluation**

As regards the survey, app called “surveymokey” was used. This platform was convenient for the survey as it enables to choose different types of questions like open-ended, multiple choice and others. Therefore, it was suitable for this research. Participants of the survey are representatives of different grades, which makes the results more reliable and enables to generalize the results and apply them to the whole school. However, in order to make them generalizable for larger area several schools of Oskemen should participate in it.

Using focus group discussion, it was possible to look at the problem from the perspective of students and to know why they are not satisfied with food in the canteen. Regarding weaknesses, half of participants should be those who like food and the rest who do not like it so as to get weighed results. If there are almost no students who like food in the canteen it will be useful to ask participants who do not like food to find some strengths of food/meal in NIS Oskemen canteen. Also half of participants should be males and other females because men tend to eat more while girls eat less to stay slim. Therefore, it is important to take this factor into account. During the focus group discussion, all participants concurred that the best way to reduce leftovers will be to change the menu. However, after conducting the interview it was found out that it is quite hard to change the menu due to some bans. The main strengths of interview with school nutritionist are that obtained data helped to answer one of the main research questions “What is done with left food?”, “What are some probable solutions to the problem?” and to look at the problem from different perspective. However, the gained data is not so reliable since the nutritionist is biased. Therefore, in order to get more valid information few cooks can be asked to take part in the interview.

As regards to conclusion, data gained from primary and secondary researches were used and references were written. Moreover, extent of generalization and validity of the results were discussed, all questions were answered. However, more information from secondary research should be used to answer research question as to make conclusion more trustworthy.

**Further research**

Some new questions were arisen after conducting the interview. For instance:

* Why salads must contain no more than 4 ingredients?
* Are students aware of the special menu for vegetarians?
* If a significant number of students do not have enough time to eat, then why the canteen is usually empty after 10-15 minutes from the beginning of the meal time?

Answers to these questions may help to understand why some bans were introduced and find some dishes that could be beneficial for health and delicious at the same time. It can be assumed that there are some vegetarians in the school, but they do not know about the special menu. Also answer to the last question may help to understand whether prolonging time would be an effective method to reduce the amount of leftovers. In order to answer the first question, the secondary research can be used. Regarding the second and the third questions, it will be effective to make a short survey and ask students.

Also it will be beneficial to make a research about the food in the buffet for teachers, because teachers have an opportunity to choose dishes by themselves. It can be useful to observe how much food is left in the buffet and in the canteen. Then the results should be compared in order to understand could the opportunity to choose food reduce leftovers.

During the research, I found out how thorny this issue is in NIS Ust-Kamenogorsk: among all participants of the survey and focus group discussion there are almost no students who are totally satisfied with food given in the canteen. My personal perspective did not change; however, I have understood that the scale of the problem is much more immense than I thought.

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**Appendices**

Appendix 1 - Survey ​

1) Estimate the quality of food in the canteen (5-like it.1-dislike it)

2)Do you have enough time to eat in our canteen? Yes/no

3) How often do you leave leftovers in the school? Every day/Often/seldom/never

4) What dishes/ products/ drinks you do not like in the canteen?

5) What dishes/ products/ drinks you would like to see in the canteen?

6) What else would you like to change in the canteen?

Appendix 2 – Semi –structured Interview Questions​

1) How much food is left daily? (what do you think about it/ are you concerned?)

2) What products are usually left?

3) What is done with leftovers?

4) Do you have any suggestions how to reduce leftovers?

5) Can products that students usually leave be changed to some others?

Appendix 3 – Focus Group Discussion

What dishes do you like/ dislike?

What dishes you would like to see in our canteen?

What other suggestions do you have to reduce leftovers?

What are the advantages/ disadvantages of these suggestions?