



Food Safety, Nutrition and Hygiene for Elementary Schools in Africa

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INTRODUCTION:

When issues like food safety, Nutrition and hygiene as it pertains to schools in Africa is mentioned, it raises a flag that is evident in deficiencies and mal-practices in majority of schools in the Continent. It is arguable that schools in this region do not have a standardized order of food and snack delivery and availability to pupils. This means the needs and requirements of the average pupil/student in the school are often not met.

WHY FOOD SAFETY & HYGIENE STANDARDS?

Food safety is about handling, storing and preparing food to prevent infection and help to make sure that our food keeps enough nutrients for us to have a healthy diet (FAO, 2001).

Usually, Food Safety Standards are intended to ensure that food offered to students is acquired, prepared, stored, and served in a safe manner.

Attention should be particularly paid to the hygiene of foods to be served at school gatherings as it is expected that foods served at these public gatherings and meetings must at all times be clean and healthy. Food safety and hygiene should be a prerequisite for approval and acceptance of the food and snack servings sold or offered by school authority and should adhere to laid down rules and guidelines about food hygiene which direct and streamline the quality of food served to children . It is therefore the responsibility of the school authorities to ensure that the food and snacks peddled and sold around and within the school environment are hygienic and were prepared

with utmost care and consideration for the health and growth of the school children.

The correct handling of food and a high level of personal hygiene are keys to food safety. Correct food safety procedures must be understood by everyone who handles food or works in the kitchen, including volunteers and children. Nominating a person responsible for supervising canteen operations, including food safety training, is essential to ensure that correct procedures are followed. This canteen supervisor must be able to convey these procedures (including the principles of food safety) to everyone working in the canteen. The canteen supervisor should also be responsible for the implementation of the Food Safety Program.

IMPORTANCE OF NUTRITION PROGRAMS

A healthy child is a happy child and a happy child loves to eat good, clean and nutritious food.

Research has found that generally poor nutrition can negatively affect cognitive ability, concentration and activity levels in the short term (Sorhaindo & Feinstein, 2006), and has been associated with poor academic performance and behaviour issues in the longer term (Alaimo, Olson & Frongillo, 2001). The quality of children's diets has also been found to have an effect on their academic performance. Researchers examined the association between overall diet quality and academic performance across various indicators of diet quality. Students with decreased overall diet quality were significantly more likely to perform poorly on academic assessment (Florence, Asbridge and Veugelers, 2003).

School nutrition programs can improve the health and learning potential of children. Children have high nutrient needs in relation to the volume of food they eat; therefore, it is essential to serve foods that are high in nutritional value. Also, serve food without excessive fat, salt and sugar. Nutritious food supports growth, good health, healthy weight and optimal learning. Nutrition and Food Safety Guidelines for Af-

frican schools will promote the provision of high quality nutritious food and the management of efficient economical food service. Guidelines should apply to breakfast/snack/lunch programs in elementary and secondary schools. Many of the concepts can also be applied to other food environments in schools, such as school & classroom celebrations, special food days, fundraisers, cafeterias, canteens, vending machines, meetings, or staff rooms. For guidance in applying these guidelines, consult a Public Health Nutritionist in your Health Region.

FOOD SERVED IN SCHOOLS

The nutrient value of the foods to be delivered to young children is also important. This is because they are at a stage where nutrition plays an important role in their lives. Dairy products like milk, yogurt and fruit drinks as well as other relishes like ice cream come in different preservative packs as no fresh drink is easily gotten and it is almost a safe option and safer for the children. There are also some energy giving

foods to elevate the strengths of the children during a day gathering that involving strenuous activity like sports and game competitions. A known delicacy like chicken/ meat/ suya could also appeal to some children and adults like teachers and parents but one has to be quite careful about the preparation as it needs an expert who can prepare it with special attention to hygiene. Consideration has to be given to the type of meat used, the condition of its slaughter and the hygiene of the roasting process. There will be no food stand that caters for school children without the inclusion of pastries like small bread, meat pie doughnut, cakes etc. It is noteworthy to say that irrespective of the gathering, certain foods are expected to be available at meetings like Parents Teachers Association periodic meetings, events to raise money for a particular cause etc. There are everyday foods for the consumption of the school pupils that are also sold to the children as well.

SAFEGUARDING THE FOODS PREPARED FOR CHILDREN

In most African schools, there is a kiosk or shop set aside for the sales of food items to the school children during allotted breaks. Those who man these stalls may be either Vendors approved by the school or be employed by the school. Whichever, it may be, it is essential that the following points be noted before allowing or employing individuals to set up such kiosks or stalls;

Prospective seller must have basic health education.

(S)he should be able to demonstrate evidence of food hygiene standards.

If applicable, such a person should be approved by

The municipal health body.

It may be necessary to inquire of prior experience in

Similar business.

Apart from the people involved in the business, there is the need also to ensure that the structures to be used are those that will contribute to food hygiene. Considerations to be thought about include

- The structure must not be situated close to toilets, bathrooms or septic tanks
- The location should have easy access to portable water from a verified safe source
- The location must be well ventilated
- Proper drainage facilities should be available for such places

After these steps have been taken, there is need for continuous supervision and evaluation of the successful candidate for the position. Such supervision should be regular, if possible, daily, while evaluation could be periodic. Supervision will entail closely ascertaining the quality of the input materials, the processes such materials undergo before they reach the form ingested by the children and the manner of storage and presentation to the children.

Features to check for during Input supervision

- Are the raw food materials in good condition?
- Are fruits to be used ripe enough without becoming rotten already?
- Are items like tomatoes strong enough and not decayed?
- Are all seasonings to be used properly checked to ensure materials banned by the government are not included?
- Are none of the materials expired already?

Features to check for during process supervision

- What kind of materials are used to process the food?
- Are there any metallic materials that could leach ions into the food?
- What health condition is the cook in
- Is he/she free from communicable diseases?
- Is he/she also free from cuts or lesions that may contaminate the process?
- Are items boiled to the proper degree?

It is also a standard procedure that when there is a public function or activity to be undertaken by the school, and it is their desire that they handle the feeding the drinks, school authorities know that they ought to obtain a permit from the appropriate health council which in Nigeria would most probably be situate at a local government council. Of course, interviews would be conducted and the credibility of the organizers of the gathering as well as the food handlers will be ascertained. The whole process does not end there as training classes all which are calculated towards adequately preparing the attendants and food handlers on the right approach to food viz a vis, an enlightenment on the observance of food hygiene and the maintenance thereof of the food in order to avoid food poisoning or any epidemic poisoning.

It is also important that the value of nutrition be impacted into these school food handlers as it will eventually dictate the type of food to be prepared for the kids and how it would be beneficial to them.

What assortment of foods has been put in place?

Are all essential food nutrients provided for in the meals?

Is special consideration given to those with cases of allergies in the school?

When a school undertakes the decision to be responsible for the preparation and availability of foods to its pupils then adequate care must be taken to ensure that the that the utensils and the cooking wares must at all times meet the standards of the health department and the basic if not more caution applied to maintaining the sanitization of the equipments.

CLEANING THE COOKING FACILITY

It is expected that the store house or room for the food raw materials are kept in a high state of cleanliness. When the storage room is unhygienic, then is-

sues like food poisoning will occur and this will lead to illness, an epidemic and even, at a worse case scenario, death. It is also to be expected that adequate care and attention paid even to the detailed acts of cleaning the eating utensils as used by the pupils. In a situation where by a school finds out after research and investigation that they are not equipped to run to handle feeding their students and it so happens that they still want to go ahead to provide for the consumption needs of their pupils, then, the next alternative the school authority can do is to get in touch with the health experts at the government's health department of which, it is expected that these experts would scrutinize the available equipments and structure in other to advice the school on how to proceed in the preparation of foods for the children and the precautions to take.

FOOD MATERIALS AND THE SET UP FOR COOKING AND STORAGE/ PRESERVATION

For food that is to be given to pupils, as was earlier mentioned, it should be done with a conscious effort towards hygiene and care therefore at the earliest possible time, the health department should be contacted so that an inspector will be sent to inspect and to ascertain that the school has the right to cook and serve. This place could be a public kitchen where people come and eat or a school cafeteria, an eatery or any other set up where food is served. It is a known fact that not all prepared food can be consumed all in one day and also, there are some raw foods for cooking that need a particular and surer way of preservation. Some foods just need to be stored at a constant room temperature like bread, biscuits, some packaged foods like cornflakes, custard powder, golden morn, etc. When it comes to refrigerating foods, care must be taken to maintain those foods- perishable and otherwise at a particular temperature. Despite the lighting situation in Nigeria, there are some foods that must be frozen to be pre-

served so as not to get sour or rotten; some of those foods include fresh fish, meat, chicken, etc. Foods like eggs, butter, milk, juice, vegetables, etc must maintain a particular temperature in the refrigerator to be considered safe and in perfect condition.

REFRIGERATOR FOOD PRESERVATION

Points to note in Food Preservation

- What condition is the store in?
- Is it free from rodents and fleas?
- Is the store well aerated?
- Is the freezer working properly?
- What can of preservatives are applied on the food?
- Are they approved by the government?

It is important that high risk foods are maintained either cold (below 5°C) or hot (above 60°C). A thermometer should be used to keep a check on temperature-holding equipment to ensure that it is working correctly. When using a thermometer to check tem-

peratures, it is important that it measures accurately. For this reason, the thermometer must be calibrated.

LEARN ABOUT GERMS

Not all germs are bad though; there are germs-microorganisms that are also useful in the production of certain foods which can be found in the yogurt that kids love as well as cheese, yeast and alcoholic drinks as well as wine. These microorganisms can also be put to good use like the productions of some medicines like penicillin, including a number of other medicines. Be that as it may, there are still some microorganisms that are extremely harmful to the human body. It is to be noted that children are more susceptible to the harmful effects of germs in foods as their immune systems are still growing. One more important feature of these germs is that most times there is no visible change in the colour or taste of the foods. This does not apply to all the foods such as sour yogurt that can be identified by the taste or bad eggs or spoilt soup, foods in general which are solely

explained by the presence of germs in the food can be presented in the way of sight, smell and bad taste.

The irony of it all is that there is no secluded area that germs- microorganisms are found; the truth is that they are found anywhere, even in the cleanest environment where we live and in everything that we do. The pets we love to have and be with all have germs as well as everything we love to use to in order to survive. As humans, we also carry germs around, in our hair, our faces, hand and toe nails and any part of our bodies that are constantly exposed to contact with other surfaces or people. Thus even when we may believe that there are no germs, that assumption is more often than not termed to be myopic and in reality we as individuals are responsible for the movement of germs and therefore, the contamination of everything we come in contact with. The most common means of transferring germs is mostly known to be through the use of the hands but other means are though fluids, blood, airborne, animals and of course, pet animals.

MICROORGANISMS

When microorganisms are transferred from one place to the other, they tend to adapt to that particular environment. Some microorganisms/ germs are known to comfortably survive in a very hot environment and others survive under very cold circumstances. It should be noted however, that there are still some microorganisms that can survive under very harsh hot or cold conditions by adapting to the various presentations. By way of adaptation and survival, they feed and drink from that particular host/ environment and as they do so, multiply within themselves. They also require basic survival things that living organisms require which are air, food water, warmth, cold, security, etc. These micro organisms infiltrate themselves into some vulnerable types of food that are receptive towards such pollution. For microorganisms, their method of increasing or multiplication really fast; then it is safe to assume that its rate of adaptation is on the average of 13 minutes which is alarming as foods have are at the mercy of these microorganisms. According to some sources,

the scariest part is that in an average of seven (7) hours just one germ can automatically be triple multiplied to a number of 17million. This is so scary in the sense that if a small of amount of germs can very well be the cause of one's illnesses, then millions of it can very well cause a massive epidemic.

In summary, the Canadian "IN GOOD HANDS" programme, 2015 states that there are six factors that affect the growth of bacteria. You can remember the six factors more easily if you remember the first letter of each: FATTOM. Just think of the cartoon of the phantom or think of 'Fat Tom', a chef who likes to taste his food!

Bacteria - Growth factors: FOOD

Bacteria are living organisms that need food. They grow best in food that is moist and high in protein. These foods are considered high-risk foods. Here are some examples:

- Milk and milk products
- Sliced melons
- Garlic-and-oil mixture

Poultry
Meat: beef, pork, lamb and veal
Fish and seafood
Sprouts
Eggs
Soy products (like tofu)
Cooked rice, beans, grains, vegetables and potatoes
Mayonnaise-based salads (like egg, potato and tuna salad)

Bacteria - Growth factors: ACIDITY

pH is a measurement of acidity and alkalinity in food. The amount of acidity or alkalinity can be measured with a pH meter. pH scale ranges from 0 to 14. As you can see from the scale below, foods such as fruit and vinegar are acidic in the 0 to 4.5 range. Although some bacteria can survive in acidic foods, they don't grow in highly acidic conditions.

Foods such as meat, dairy and even melons are considered to be weakly acidic or neutral, in the 4.5 to 7 range. This is the type of environment bacteria grow very well in.

Foods such as egg whites and soda crackers are alkaline, in the range from 8 to 14. These alkaline foods will not support the growth of bacteria.

Bacteria - Growth factors: TIME

High risk foods should not be in the temperature danger zone for more than 2 hours. The 2-hour rule gives a good safety margin since you may not know the details of what happened to the food before, during or after the delivery.

Bacteria - Growth factors: TEMPERATURE

Bacteria grow well in the temperature range from 4°C (40°F) to 60°C (140°F). This is called the Temperature Danger Zone (TDZ). Bacteria grow and multiply quickly in food that is kept in this range.

When you handle food, it is important that high risk foods spend as little time in this temperature

range as possible. High Risk Foods should not be in the Temperature Danger Zone more than 2 hours.

Although keeping food in the refrigerator keeps it out of the temperature danger zone, this only slows down bacterial growth; bacteria do not stop growing in the fridge! Holding food above 60°C (140°F) will stop bacteria from growing and will even kill some. High cooking temperatures will kill bacteria.

Bacteria - Growth factors: OXYGEN

Some bacteria will only grow where there is oxygen present. They are called aerobic bacteria.

Other bacteria will only grow where there is no oxygen present and are called anaerobic bacteria. Food-borne illness can be caused by either type.

Bacteria - Growth factors: MOISTURE

Water activity (A_w) is a way of measuring the amount of moisture in a food. Bacteria need water to grow.

They will survive in foods that do not have a lot of moisture, but will not grow. (For example: Salmonella bacteria survive on an eggshell but they don't multiply there because of lack of moisture.)

GERMS ON FOOD

There are other toxic substances which are directly responsible for making people fall ill and they can be attributed to the environment we live in and the waste substances that are emitted into the environment ; also there are illnesses we deliberately or unknowingly come in contact with like dangerous chemicals that which are actually useful in our daily lives like cleaning agents, insecticides. All of which may be avoided if we only store them up in the appropriate places. This could even avoid the formation or even the breeding of new strains of microorganisms from attacking us. Ultimately, we have to understand that in order to stop the transfer of germs and invariably, their multiplication thereof as well as a sure means of killing microorganisms, diseases, sicknesses

at bay. In order that we have and are sure that we and children from all over may stop being ill, there are five paramount keys to maintain the hygiene in our foods and as directed by The World Health Organization and they are:

1. Always keeping clean;
2. Maintain a separation between the cooked and uncooked (raw) foods;
3. Make sure that food is well cooked;
4. Always make sure that every type of food is kept at the most suitable temperature to maintain its condition;
5. Culture the habit of using clean water and good raw food materials in other to the best.

FOOD AS IT PERTAINS TO SCHOOLS AND CHILDREN

These days, so many schools undertake the project of catering for their students for different purposes or reasons. These services come in various ways which could be school-parent-pupils hangout/ get together, sports events or launching of a project that the

school has completed. Most schools are also set up a little shop comprising of foods that will suit the tastes buds and nutritional needs of the students. Always though, it is emphasized that the foods prepared or sold must meet the health guidelines and the laid down principles for which nutrition upholds. The packaged drinks and foods must at all times contain a valid registration number as well as the production and expiration date. This is to ensure that the foods sold or provided by the school are hygienic, safe and perfect for the tender yet health growing children. As much as it is important to the well being of the children, the reputation and stability of the schools is one of the most important as food can either make or mar a schools' name.

If the school is planning a big event or gathering and want to use the products from their stores as a form a refreshments or in situations where the school has appointed teachers to be in charge of cooking and feeding, the school is emphatically advice to seek the expert advice from the government health department who will now in turn appoint an health expert

to train the teachers on nutrition and steps on how to attain perfection in combining nutrition and hygiene. The two, evidently must go hand in hand to achieve a reason to be glad, grateful and the results of perfect. Lesson on safety will also be impacted on the teachers. Different delicacies will be presented so that the teachers will have an idea on how they are prepared in order to avoid contamination the foods by the transference of germs from one location to another. As many as the questions may be, it would all be in accordance with the foods that the teachers want to present as well as the snacks. The training session with the health expert will eventually dictate the kind of foods that the children will have; this also boils down to the kind of drinks that will be served along with the perfect meal to go with it that will not cause any discomfort for the children.

HOW TO CONSTANTLY KEEP YOUR FOODS SAFE AND IN PERFECT CONDITION

If you intend to set up a store for kids' foods and drink, you must make sure that you read this bro-

chure; also, schools deciding to provide food for children; be it during lunch breaks, in boarding school dormitories/ houses, events or outdoor gatherings must make it a priority to read this part of the brochure. Always make that care adequate care is taken to get good and reliable suppliers for all the foods, drinks and market needs as regards the raw materials for cooking. After the buying transactions have been completed, the next in line would be ensuring that the equipments are in top notch, they are up to date and well kept. The equipments must be washed clean without grease or stains. The kitchen to be used must met the basic requirements of a public kitchen which means that it must contain a store to keep dry foods and the cookers must be of a size to carter for large number of children or people. The truth is, a kitchen, be it private or public must have certain basic equipments and features that will make it conducive for any type of cooking whatsoever.

When cooking for public use and one that will be for children, care must be taken about the particular grade or class of raw food materials to be used in

food cooking. Thus, everything must be carefully examined to make sure that they would not fail the test of inspection in that event that it occurs. Most non-perishable foods should be packed and stored up in the store room; the semi-perishable foods or totally perishable foods must be preserved in the refrigerator and freezer depending on the type of foods. I believe examples of the different foods have been given in an earlier section of this brochure. There are foods that are better preserved in a tight locked tin or plastic container which could be powdered milk, ground crayfish, ground pepper all of which should be kept at a steady room temperature.

In terms of actual cooking, every cook has a particular method of cooking but irrespective of that there are basic practices that every cook must have knowledge of; which includes the foods must be prepared to be served on time, in other words, a hot meal, is much more better than when cold and over stayed. It is also necessary for foods to be cooked at a perfect high heat so as to destroy the germs irrespective of how stubborn they may be, most micro organ-

isms cannot survive extreme heat. Each meal that has been cooked for the consumption of the school children must be ideally served within thirty (30) minutes of preparation to the children and the handling of the foods as well as the serving must be done with extreme care as you must make sure your hands are washed before serving and after serving. This is to put a halt to the transfer of germs indiscriminately.

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