



# Kwazulu-Natal Food Monitoring Protocol



## **KWAZULU-NATAL FOOD MONITORING PROTOCOL 2000**

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## EXECUTIVE SUMMARY

In recent years, several events have highlighted the importance of food safety and food monitoring.

Strengthening of food safety and quality control systems, promoting good manufacturing practices and educating food retailers and consumers about appropriate food handling are essential for health and good nutrition. In addition to consumer protection, proper food control measures reduce food losses and can stimulate trade in food products, thus creating employment, increasing incomes and improving nutritional well-being.

This document is intended to provide guidance for the Directorate in strengthening its Provincial food safety programme and to enhance collaboration between all sectors involved in the development. These guidelines are intended to assist Authorities wishing to strengthen their food safety programme as part of their overall food control and consumer protection strategies. This guideline should also be of interest to Non-Governmental Organisations, Industry and trade Association and Consumer Groups that have a vested interest in the safety of the food supply.

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## 1.0. BACKGROUND

Food is the major source of exposure to pathogenic agents, both chemical and biological from which no one in either developing or developed countries is spared. Foods contaminated with unacceptable levels of pathogens and chemical contaminants or having other hazardous characteristics, impose substantial health risks to consumers and severe economic burdens on individual communities and nations.

Of the approximately 1,500 million global episodes of diarrhoea occurring annually, resulting in 3 million deaths among children under five, 70% have been estimated to have been caused by biologically contaminated foods. Contaminated food has been recognised as playing a major role in the epidemiology of cholera and other forms of epidemic diseases. In many industrialised countries, rising trends in a number of foodborne diseases, such as salmonellosis, campylobacteriosis and infections caused by E. Coli have been observed over the last few decades.

Foodborne exposure to agricultural and environmental chemicals concerns public health officials in most countries. In developing countries where an overwhelming majority of acute pesticide poisoning occurs, the little published information indicates that there is significant exposure to the general population to pesticide residue in food. In addition, mycotoxins and other naturally occurring toxins are known to present acute and chronic health hazards and are a world-wide problem.

## 2.0. INTRODUCTION

Food laws and control programmes are more needed now than ever before. The intent of legislation in food safety has been traditionally concerned with the introduction of a control system to address problems of microbiological contamination which now causes most outbreaks of foodborne illnesses and to deal with the increasing risk of chemical contamination and attendant health hazard.

The establishment of an effective control service must be preceded by careful planning. The object of any food control service is to promote a safe, and honestly presented food supply to protect consumers against being offered foods, which are injurious to health, unfit for human consumption, adulterated or persisted in a deceptive manner.

Foods can become microbiologically hazardous to the consumer when the basic principles of hygiene are not met. Therefore the examination of food samples allows us to determine the presence of these hazards. Many different micro-organisms have been associated with foodborne diseases. Increasingly the need to assess the safety of foods and to a lesser extent the quality of food is being recognised. Surveillance has also become increasingly important due to the increase in international trade in foods.

Hazards which could stem from the introduction of new techniques for mass production, rapid and widespread distribution, and introduction into commerce of foods from areas with endemic enteric diseases. Control agencies need authoritative guidance on uncertainty:-

- ◆ The significance of particular species or groups of micro-organisms when found in foods;
  - ◆ Microbiological specifications or standards.
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This document sets out to explain to Environmental Health Officers (EHO's) the use of significant Species or groups of micro-organisms used in microbiological analysis data especially in instances where no microbiological legislative standard exists. What happens when no standards exist for foodstuffs in current legislation? The question that normally arises is that what should be tested for and how should these results be interpreted?

In cases where no legal standards exist it is very important that results be carefully assessed before decisions are taken on whether foodstuffs pose a risk to the health of consumers. In times of foodborne pathogens, the rule of THUMB is that processed foods should be free from pathogens, example Salmonella, C. botulinum and E. coli.

To assess safety of foods one needs to understand what foodborne pathogens are, which foods are likely vehicles of these pathogens and what levels may cause foodborne disease.

Finally it must be remembered that even though end – product sampling for, amongst others, statutory compliance, has its place in determining the safety of foods, emphasis should also be placed on promoting the introduction of preventive systems such as HACCP to ensure food safety.

#### **AIMS :**

- ◆ Give strategic directives for the development of food control and food safety;
- ◆ Outline the nature of food monitoring which are needed in the medium to long term;
- ◆ Identify the facilities, resources and staff required for rendering this monitoring;
- ◆ Estimate the cost of implementing the improved service.

#### **OBJECTIVES:**

- ◆ Formulation of a Provincial Food Monitoring system;
- ◆ Promotion of the management systems for food safety assurance example HACCP;
- ◆ Education of food handlers, EHO's and Analysis in food safety.

### **3.0. METHODOLOGY**

Routine examination of foods for a range of pathogenic micro-organisms is impractical. In order to assess the microbiological safety from foodborne pathogens, widespread use of groups or species which are easily enumerated and whose presence in food indicates exposure to conditions as it would be explained further on. When developing a food monitoring system careful planning and extensive consultation by relevant Government Authorities within the food sector are required.

In order to facilitate the planning, implementation and evaluation of a programme to ensure food safety it is important to prepare a profile and database that will provide relevant information on factors that may influence food safety. There are many different sectors and disciplines involved in food safety, with responsibility allocated between government agencies, industry and consumers. Within Governments many different specialised agencies are involved usually

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within Departments of Health, Agriculture and Trade. Dialogue and collaboration between the various agencies and partners are essential for the formulation of a monitoring system and its effective implementation. Food safety is a major concern in administering the food chain and is the responsibility of the many different Government Departments and therefore co-ordination between these various Departments is essential for efficient control.

One needs to follow the principal stages of a food monitoring system to help these many Government Agencies to establish their basis on monitoring of food. Appended hereunder are the areas that one needs to include in the monitoring programme.

### **3.1. PRIMARY PRODUCTION**

Food Safety would naturally begin with its suppliers (farmers) and those involved in food production. Principles of HACCP should be implemented, as this would ensure food safety at the start of the food chain. Agricultural inputs need to be carefully monitored by farmers themselves as well as ensure that these products would not pose a health risk to the other stages of the food chain. Special attention is required regarding food hygiene when animals are slaughtered at abattoirs or when milk is produced on farms, as these foods may serve as vehicles for transmission of health hazards.

### **3.2. SECONDARY FOOD PROCESSING**

These include a variety of processed foods that have been manufactured using highly sophisticated methods to ensure safety, extend shelf-life and reduce spoilage. Principles of food safety management need to be strictly applied in order to minimise the risk of potential food safety hazards. The principles of HACCP would enhance and strengthen food safety of this sector. Good Manufacturing Practice (GMP) as well as constant surveillance by the key role-players would ensure quality assurance and safety against any health hazards.

The Environmental Health Officers should ensure that Industries of such nature abide by regulations and legislation in order to improve food standards and not decline in their practices and conditions of this sector.

### **3.3. FOOD DISTRIBUTION**

In this sector, distribution of foods can be dealt with by several different Government Agencies namely, Provincial Department of Health, TLC's and Port Health. Practices and conditions regarding storage, transport and distribution of foods can have an influence on product safety; both that national food supply and products traded internationally. The TLC would ensure the storage; transport and distribution internally are complied with and satisfy all requirements of food safety. Port Health should maintain high standards of food safety when dealing with products that are imported. These Departments may be different in some ways but the principles of food safety must still be maintained. EHO's and food distributors should ensure proper storage facilities with correct temperatures as well as proper transportation during distribution.

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### 3.4. FOOD RETAILING

The sale of food in supermarkets and shops and in the informal sector such as street vendors and market stalls are of great importance as these are easily contaminated and have a high risk factor due to it being sold almost directly to the consumer. The key role-players here are the E.H.O's to enforce legislation and other regulations to ensure that food safety standards are being followed. Their duties would include general inspections, sampling and analysis. Once this is obtained, corrective measures can be implemented or legal action may be taken.

### 3.5. FOOD CATERING

Food handling, preparation and storage in food service establishments require special provisions with regard to hygiene, safety, pest and sanitation control, in both the formal and informal sectors. It is widely recognised that most foodborne disease occur as a result of incorrect handling and preparation of foods for consumption.

### 3.6. DOMESTIC FOOD PREPERATION

Educating consumers on storage, handling and preparation of foods in the home is essential if one wants to eliminate the risk of diseases. Improper handling and preparation by consumers often neglect the food safety measures introduced by other sectors in the earlier stages.

The HACCP system is a cost effective management tool for food safety assurance that can be applied to all sections of the food chain from primary production to the point of consumption. It is now recognised as an essential tool for use by the food industry in the control of food contamination and enhancing food safety.

Routine monitoring of food operations is the responsibility of EHO's in order to ensure food safety control. It is established that EHO's of each Department are allocated an area of jurisdiction. It is the duty of EHO's to ensure that he/she maintains a standard of food safety. This effective food control infrastructure must provide for sampling foods and inspecting the premises where they are prepared, packed stored or held for sale. An analyst however, can further accompany this, particularly if the inspection requires the expert knowledge of a chemist or microbiologist.

The Officer occupies a key position in the food control service, where he is the eye and ears of his agency and must be able to recognise, collect and transmit evidence when violation has occurred. He collects samples for routine or special analysis. Sampling will therefore allow one to control foodstuffs with regards to chemical and microbiological contamination. In order to obtain analysis food products have to be sampled. A method of Selective and Random Sampling was formulated to establish a controlled monitoring system. Selective sampling is a system whereby specific or certain foods are selected for a food run that would occur on a monthly basis, (Refer to annexure A). This monthly based system would incorporate certain foods that would be sampled and analysed for that specific month, and this would include all districts/regions participating in this food run.

This would include re-sampling and testing of the same products in order to obtain the

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desired results and provide corrective measures. The system provides a rational approach to the control of microbiological hazards in food and avoids the many weaknesses inherent in the inspectional approach and circumvents the shortcomings of reliance on microbiological testing. Random sampling requires food products to be randomly selected and analysed. These samples will be obtained on general inspections of premises in order to examine, extract any foodstuffs found upon such premises to be hazardous or a health risk. This method may work in conjunction with the selective sampling where, if an EHO in his own discretion feels that further food samples, besides the set food run, requires to be analysis he may remove this food product for further analysis in order to take further action.

The EHO in his opinion may feel that certain samples have frequently posed a health risk can request that this food product be sampled in the entire region and this may be listed on the selected food run. This would be able to establish if similar problems arise in other regions, if so then one can implement stricter food control measures. Officers need to be open minded when it comes to sampling. Even though a set food run has been supplied, the EHO need not leave out any food items that may be of concern thereby incorporating both the selective random sampling as well as random sampling when doing their sampling. Intelligent inspection with selective sampling, followed by accurate analysis and appropriate administrative or legal action provides the most complete approach to consumer protection.

One should also incorporate street vendors, as these form an important part of food distribution. Food handlers play an essential role in the prevention of foodborne disease. They may act as a source of food contamination, through inadequate personal hygiene or when handling food when they are medically unfit. Appropriate education programmes are needed that are aimed at domestic food preparation and storage, particularly in developing countries, where access to the food cold chain is not always possible and foods are prepared and stored at high ambient temperatures. Education programmes to achieve these aims are most effective when they are jointly supported, designed, developed and implemented by health workers, Food Safety Authorities and Consumer Groups. These education programmes can be done through the organisation of Provincial and Local seminars and workshops to raise awareness and provide incentives. We also need to train the trainers who are involved in the education of health workers and to utilise the mass media for dissemination of information on health issues.

Regulations concerning imported foods should cover all aspects of the handling of imported food, including such things as notification by importer and Customs officials, collecting and submission of samples for analysis, release or detection of the shipment, conditions under which detained foods may be brought into compliance.

Before deciding upon the design and size of a food control programme, a thorough survey should be carried out to assess needs, determine what resources are available to meet these needs and to decide whether re-organisation of laws, staff and facilities could lead to the basic structure for an effective food control system and then to establish appropriate priorities accordingly.

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### 3.7. COMPONENTS OF THE SYSTEM

- ▶ IDENTIFY HAZARDS AND ASSESS THEIR SEVERITY AND RISK;
- ▶ DETERMINE CRITICAL CONTROL POINTS;
- ▶ SPECIFY CRITERIA TO ENSURE CONTROL;
- ▶ MONITOR CRITERIA TO ENSURE CONTROL;
- ▶ TAKE CORRECTIVE ACTION WHENEVER MONITORING CRITERIA ARE NOT MET;
- ▶ VERIFY THAT THE SYSTEM IS FUNCTIONING AS PLANNED.

## 4.0. DISCUSSION

### 4.1.1. What is Food Monitoring ?

Food monitoring involves the systematic observation, measurement and/or recording of the significant factors for the control of the hazards. The monitoring procedures chosen must enable action to be taken to rectify an out of control situation either before or during an operation. The monitoring exercise should detect any deviation from the specification in time for corrective action to be taken before the product is sold or distributed. Five main types of monitoring are employed namely observation, sensory evaluation, measurement of physical properties, chemical testing and microbiological examination.

### 4.1.2. Why do we require a monitoring system ?

A monitoring system aids in the protection of consumer against health risk and fraud. The need for the widest possible measure of international agreement on food standards in order to facilitate international trade.

### 4.1.3. Who are the Key Role-players ?

Within the South African context, many role-players partake in the process to put food on our table and therefore also have a role to play in the food safety and food monitoring programme. The following are some of the role-players already identified:-

- Directorate: Food Control, Department of Health;
- Directorate: Nutrition, Department of Health;
- Environmental Health Components of the Province;
- Environmental Health Components of authorised TLC's;
- Department of Agriculture:
  - Veterinary Public Health;
  - Plant and Quality Control;
- SABS (South African Bureau of Standards);
- Research Institutions:
  - CSIR (Foodtek)
  - ARC (Agriculture Research Council)
  - Dairy Research Institute;
  - Meat Research Institute;
  - Veterinary Research Institute;

- MC (Medical Research Institute);
- Training Institutions:
  - Tertiary Institutions;
  - Technikons: Environmental Health & Food Technology;
  - Universities: Microbiology, Food Science, Agriculture, etc.
  - Private Institutions.
- Private Consultants;
- Laboratories:
  - Forensic Chemistry laboratory;
  - Provincial Laboratories;
  - SAIMR: Public Health;
  - Department of Agriculture;
- National Environmental Forum;
- Members of FLAG (Food Legislation Advisory Group) & its Sub-committees;
- Industry – specific representative bodies:
  - Grocery Manufacturers Association;
  - SA Chocolate & Sweet Manufacturers Association;
  - SA Fruit & Vegetable Canneries Association;
  - SA Sugar Association;
  - SA Milk Association;
- Consumer Bodies:
  - Housewives League of S. Africa;
  - SA Co-ordinating Consumer Council;
  - SA National Consumer Union;
  - SA National Black Consumers Union;
- International Institutions / Bodies:
  - WHO: Food Safety & Food Security Division;
  - FAO: Food and Agriculture Organisation.

To avoid complicating the situation the writer is of the opinion that in a Provincial context this can be scaled down to the Provincial Co-ordinator, Environmental Health Officers (EHO's), Analysts and the Consumer.

**The Co-ordinator** : is necessary to ensure effective supervision and control and to take follow-up action as may be required on work of the field of the EHO's and laboratory staff. They are also involved with planning programmes for the inspection, sampling and analysis of food.

**EHO's**: will inspect and sample foods and initiate appropriate action. The EHO occupies a key position in the food-monitoring programme:

- He co-operates with other food officials at the local level;
- He investigates the complaints of consumers about the safety or unfitness of foods and any other reports concerning possible violations of the food law;
- He should be trained to inspect various types of food establishments for compliance with sanitary requirements and hygienic practices;

He often participates in consumer education.

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**ANALYST:** the mutual interest which exists in the work of analyst and EHO should be stimulated to promote closer co-operation and increase effectiveness in their efforts to provide better consumer protection, the laboratory service will analyse and evaluate foods. As may be required and initiate action as well.

**CONSUMER:** the benefits derived from a food monitoring programme will depend to a large extent upon the degree of consumer participation and support. Pressure from consumers is often needed to persuade legislators to enact food laws. Food laws, food standards and other regulations are likely to be better fitted to consumer protection if consumers have taken an active part in their elaboration. Well-informed and interested consumers can do much to ensure the financial and moral support needed for the effective administration of food laws. Consumers who understand what they require are likely to insist on food handlers and dealers complying with requirements. For effective participation in food control programmes, consumers need to be educated and organised.

#### **4.1.4. Where Should Food Monitoring Take Place ?**

The selection of the places to be studied and evaluated can be based on four factors namely: Food property, food operation; volume of food preparation and susceptibility.

#### **4.1.5. When Should Food Monitoring Take Place ?**

On a monthly basis for selective and if necessary weekly basis for random sampling.

### **4.2. STAGES OF ASSESSMENT PROCESS**

- ▶ A planning process to focus and direct the assessment.
- ▶ An on-site assessment to gather relevant information.
- ▶ An evaluation process to analyse findings, determine compliance and decide on follow-up actions.

#### **4.2.1. THE PLANNING PROCESS**

Planning helps clarify the scope of the assessment and the approach that will take place on site. This ensures that assessors have the necessary information and tools to complete an effective assessment. Information that will help in this process includes:-

- relevant company documentation;
- previous file record, data on premises and products;
- results from previous visits or assessments.

A review of documentation available to Government Authorities could be carried out of-site. In some instances there may be some constraints which make this difficulty or impractical. Information obtained from the planning stage helps determine the focus of the assessment and the skills which might be necessary, particularly where assessment would be carried out by a team. It provides an opportunity to refine any checklist and protocols that might be used and where appropriate, communicate arrangements of the visits to the establishment.

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#### **4.2.2. ON-SITE ASSESSMENT**

The purpose of on-site assessment is to confirm that procedures and practices described are implemented and are adequate to ensure food safety. This ensures that principles of HACCP are carried out effectively. This would involve the physical examination of the processes, practices and records, by observation, measurement or interview to assess whether the actual operation in practice complies with the documented procedures.

#### **4.2.3. EVALUATION PROCESS**

The assessor will need to identify and analyse all information obtained during the assessment in order to draw up preliminary conclusions of deficiencies found, if any, and their effect on food safety, regulatory compliance or other trade related concerns. Assessors should use the findings of their investigations to evaluate the effect any deficiencies have on food safety the speed with which they would need to be rectified.

### **4.3. SAMPLING METHODS**

#### **4.3.1. SAMPLES FOR BACTERIOLOGICAL ANALYSIS**

Samples for bacteriological analysis shall be taken with sterilisation equipment and transferred to sterile sample containers taking precautions to prevent the contamination of the samples. The sample container shall be stoppered and within fifteen minutes of the samples being taken, it shall be surrounded by crushed ice or other suitable refrigerant which comes into contact with the container and is capable of reducing the temperature of the sample to and maintaining it until delivered to the laboratory not exceeding 7°C. On arrival at the laboratory the temperature shall not be above 7° C. At no time shall the sample be frozen.

#### **4.3.2. SAMPLES FOR MICROBIOLOGICAL ANALYSIS:-**

Safety and keeping qualities of foods are closely related to their microbial content. Microbiological examinations may in addition bring to light defects which were not apparent during physical inspections of the plants; such defects can be corrected through these examinations. Standards are especially useful in controlling the quality of food, which are consumed far away from the processing plant; thus they offer a valuable means of control over imported foods. (Refer to Annexure B: GUIDELINES FOR ESTABLISHING A MICROBIAL STANDARD FOR FOOD )

### **4.4. ANALYTIC SERVICES**

Adequate laboratory facilities staff with analytic chemists, microbiologist, technicians and support personal are essential to an effective food control infrastructure. Frequently violations suspected by an EHO can be varied only through laboratory examination of food samples. By visiting the laboratory occasionally the EHO may gain a better understanding of how his sampling operations fit into the overall programme, and why certain procedures must be followed to ensure the identity and integrity of samples.

Because analytical services are costly, available funds are usually limited, careful planning is

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therefore necessary to ensure the best possible service the Department can provide. This service should be convenient to EHO and administrative staff. Analysts need to follow uniform procedures and methods when analysing foods. Food standards often prescribe the method to be used, either incorporating the exact analytical procedures in the standard, or by reference to stated methods in some reference work.

Analytic chemists and microbiologists should hold University degrees and preferably have training in the complex specialised analytical procedures for analysis. Those having such training will always be expected to train other analysts and colleagues.

The anticipated number and types of food samples to be analysed each year should be determined by the size and capacity of the laboratories which may be considered necessary, staff requirements and equipment and chemicals which would be necessary for analysis. Analysts should be able to determine the cause and types of problems associated with the related foods that pose a hazard to the population. Therefore analysts play an important role in food monitoring for they are to detect any deviations from the specific requirements or standards set for food-stuffs. It is also imperative that they acquire a broad knowledge on the various micro-organisms, pathogens, harmful chemicals, preservatives, additives and other related causes of disease.

#### 4.5. INTERPRETATION

- View the standards holistically, consider the entire set of microbial criteria rather than focusing on one criterion, e.g. total bacterial counts.
- Too much emphasis should not be placed on total bacterial counts, but rather what the counts consist off or comprise.
- Base decision on the presence of indicators of faecal contamination or pathogens where provisions is made for such indicators.
- Use total bacterial counts and coliform count to evaluate hygiene aspects and decide what education at processing level is required.
- If general status of all the microbiological results is not in compliance with the standards, pay the processing plant visit to check hygiene practices and to advise accordingly.
- Resample, if necessary;
- Ask advice from the laboratory personnel who carried out the analysis or consult with the microbiologist.
- If there is a history of non-compliance and the product is a health risk to consumers formal remedial action, such as legal prosecution should be considered or product condemnation withdrawal.

#### 5.0. LIMITATIONS

##### 5.1. PEOPLE:

###### Attitude of people towards resistance to change:

Assessing a system requires a shift in attitude from traditional inspection methods to a system using different technical methods. Identifying benefits of such change to both the individual assessors as well as to government agencies might help motivate the switch to the necessary new

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approach to inspection.

### **Lack of knowledge, language and cultural difficulties:**

Another problem might be a lack of knowledge in general food safety issues and/or specific issues related to the product or operation being used. This obstacle can be overcome by training, targeted on identified gaps in knowledge. It is important to provide training and technical materials that have been translated into appropriate language and take cultural norms into account. It is equally important to ensure that assessors have the general educational background sufficient for them to understand the technical and or any other issues identified as gaps in knowledge during the planning of the training.

### **Personal judgement:**

Regulatory assessments differ from prescriptive inspections by introducing an element of flexibility and personal judgement. As a result there are likely to be problems with uniform competence and consistent assessment between assessors.

## **5.2. COST / INVESTMENTS**

- ◆ Any new system brings associated costs. Regulatory assessments are no different and any costs can be considered as investments. With proper planning, costs can be minimised. Costs to government agencies can be associated with:
  - ◆ Retraining of assessors to use the inspection system
  - ◆ Equipment, such as thermometers or pH meters
  - ◆ Developing new tools e.g. predictive modelling programmes
  - ◆ The longer time period to carry out this type of assessment and associated administrative costs.
  - ◆ Increased need for technical assistance
  - ◆ New research
  - ◆ Increased human resources
  - ◆ Open public consultations to generate consumer confidence in the new system.
  - ◆ Manpower
  - ◆ Public participation

## **5.3. INFRASTRUCTURE AND AVAILABILITY / TECHNICAL EXPERTISE**

Experience from both industrialised countries and developing countries point to problems related to infrastructure and availability or access to technical expertise.

- ❖ Absence of infrastructure suitable for the assessment of food safety situations in general and regulatory assessments of HACCP in particular.
  - ❖ Access to facilities e.g. labs, equipment. Calibration facilities.
  - ❖ Lack of pressure from consumers to change to safer food systems like HACCP.
  - ❖ Restriction of HACCP assessment to export in some countries.
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#### 5.4. LEGAL

A potential problem could be the liability of government agencies or their assessors having imposed various requirements on industry or other establishments. A potential barrier is that not all countries might have the legal authority or legal framework in place to permit this approach.

#### 6.0. ADVANTAGES OF A FOOD MONITORING SYSTEM

- Promote health of all by informing and educating consumers, industries and health authorities;
- Ensure safe foodstuffs and compliance with legal requirements
- To protect and facilitate trade by complying food legislation and regulations in line with international standards and taking into account local requirements.
- Food control programmes reduce food losses.

When consumers have confidence in the quality and safety of their foods, ensured by an effective food control service, trade increases at both the local and international level. More industries are needed to process foods. The international trade brings in more foreign exchange which in turn creates more jobs. Farmers have more outlets for their produces and marketing facilities can be improved. Consumer diets may become more varied and nutritious. A good food control programme therefore can be of benefit to all, particularly by improving the health and well being of consumers.

#### 7.0. RESOURCES

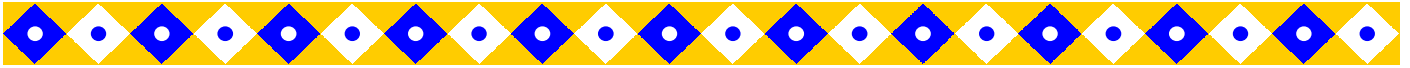
Planning and implementation will be determined largely by finance, the availability of staff of an acceptable standard, and whether or not buildings, equipment, materials, etc. are available and accessible. In planning for either the establishment or expansion of a food control service, a complete assessment of the situation should be made and placed before national planners and those responsible for priority rating or the allocation of funds. This submission should be supported by a reasonably concise and clear assessment of relative benefits to the nation, the hazards against which the service is directed and the economic and other disadvantages likely to occur.

In considering available resources, account should be taken of the need for continued support. A small organisation assured of money and competent staff to keep it operating can accomplish more than a much larger one. In fact much can be done with limited resources provided the staff members are dedicated, adequately trained and receive encouragement from authorities and general trust from the public.

Good planning should include provisions for the future expansion of the organisation and its facilities in line with anticipated growth of population, industrial and technical developments.

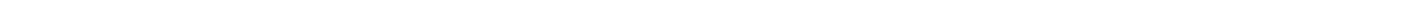
#### 8.0. CONCLUSION

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Food safety and control measures introduced by the public sector to protect the health and general well being of all the people as described above, is only a small part of the total picture. What is definitely of much more importance is the role of the food industry in this regard, as well as that of each and every consumer to be in a position to make informed decisions regarding the safety of the food they are exposed to, including, the handling and preparation thereof at home.

Self-regulation by the industry and the demands made by well informed consumers regarding the safety of the food we eat will hopefully become the most important components of the food safety system of the future. It should be borne in mind that the changes envisaged by these actions involves components that the success to be achieved through the process as described will depend on the attitudes and good intentions of those to be effected by it.

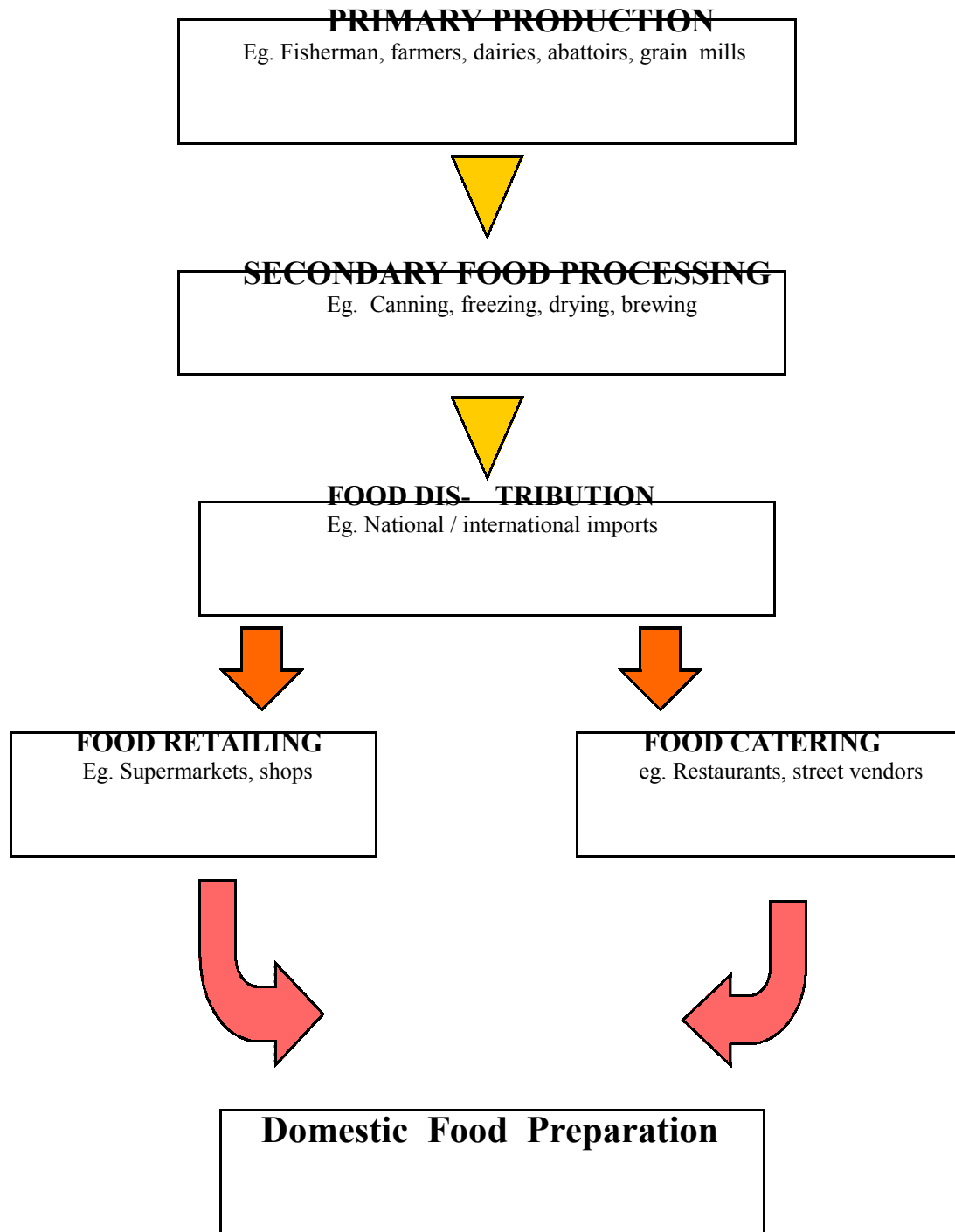




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Annexure A.



**PRINCIPAL STAGES OF FOOD MONITORING**

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**ANNEXURE B.**

MONTH	JAN	FEB	MAR	APR	MAY
FOOD TYPE	BILTONG	T / SAUCE	U / OIL	SALT	S / OIL
DC 21	17	21	22	6	16
CBDC5	0	2	1	0	10
DC 22	6	27	8	5	25
DC 23	0	7	55	12	18
DC 24	2	15	35	14	8
DBN	0	23	92	19	26
DC 25	8	7	27	0	8
DC 26	12	14	32	18	9
DC 27	4	9	10	11	12
DC 28	6	10	37	1	7
DC 29	0	0	9	16	11
<b>TOTAL</b>	<b>55</b>	<b>135</b>	<b>328</b>	<b>102</b>	<b>150</b>

MONTH	JUNE	JULY/AUG	SEPTEMBER	OCTERBER	NOVEMBER
FOOD TYPE	T / SAUCE	MILK	FISH	DESSERTS	N / OIL
DC 21	10	24	7	20	7
CBDC5	7	3	2	0	5
DC 22	10	31	0	0	12
DC 23	15	13	0	6	4
DC 24	10	12	5	0	21
DBN	16	38	0	17	16
DC 25	15	7	5	0	18
DC 26	19	26	5	7	9
DC 27	6	6	6	0	3
DC 28	27	11	5	0	12
DC 29	8	3	0	4	0
<b>TOTAL</b>	<b>143</b>	<b>174</b>	<b>35</b>	<b>54</b>	<b>107</b>

Annexure C.**FOOD GUIDELINE FOR MICROBIOLOGICAL ANALYSIS****1.1. NON – MANIPULATED ITEMS**

This category refers to items that are sampled directly from boilers or ovens in Hot kitchen areas before any slicing or handling has taken place. The core temperatures must have been 72°C for 5 minutes during the cooking process.

**ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli.....not detected in 1 gram;  
 Salmonella species.....not detected in 25 grams;  
 Staphylococcus aureus.....less than 10 / gram;  
 Clostridium perfringens.....less than 10 / gram;  
 Bacillus species (as applicable ).....less than 10 / gram;  
 Listeria monocytogens.....not detected in 25 grams;  
 Campylobacter.....not detected in 25 grams.

**NON-ESSENTIAL MICROBIOLOGICAL CRITERIA**

Coliform count.....less than 10 / gram;  
 Colony plate count .....less than 10 000 / gram.

**EXAMPLES OF FOOD IN THIS GROUP.****ALL COOKED AND DIRECTLY OUT OF THE OVEN.**

Pastry	Pizzas
Baby Chickens	Ready-to-eat frozen meals
Viennas, Russians, Frankfurts	Fat cakes
Bulk vegetables	Tinned jam
Roasts	Tinned vegetables
Fish and fish Products	Tinned fish
Deep-fried potato chips	

**1.2. MANIPULATED ITEMS AFTER COOLING.**

This applies to food such as cooked and stripped chicken, fish, plain rice, pasta, and meats for hot meals and hot desserts. It includes the portioning of hot meal items. The hot food is allowed to stand at room temperature until it reaches 65° C. Thereafter it must be blast chilled to below 6 °C within 4 hours.

**ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli.....not detected in 1 gram;  
 Salmonella species.....not detected in 25 grams;  
 Staphylococcus aureus.....less than 100 / gram;  
 Clostridium perfringens.....less than 100 / gram;

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Bacillus species (as applicable).....less than 100 / gram;  
 Bacillus cereus.....not detected in 25 grams.

#### **NON – ESSENTIAL MICROBIOLOGICAL CRITERIA**

Colony plate count .....less than 100 000 / gram;  
 Total coliform count .....less than 100 / gram ;  
 Campylobacter ( as applicable) .....not detected in 25 grams;

(This test should be carried out on poultry products).

#### **EXAMPLES OF FOODS IN THIS GROUP**

Sliced beef	Samp
Sliced pork	Sweet potato
Stew, beef, pork, chicken and mutton	Mielie rice
Rice	Meat pies
Pasta	Chips ( with sauce )
Mixed curry cabbage, onion and tomato	Toasted sandwich
Wors, sausage	Biscuits
Chicken pieces	Gravy
Chops	Noodle salad
Pizza slices	Scrambled egg, omelette
Hamburgers	Instant cereal, porridge
Big pastries for further portioning	Potato chips
Fruit pies and tarts	Sweets
Soups ( not tinned )	

#### **MANIPULATED COLD MEAL ITEM**

This includes food items such as prawns, cold sliced meats (cooked “in house” product and “brought in” product) pate’ and high risk items that will receive no further heat treatment. IT DOES NOT INCLUDE smoked or fermented products or raw fruit and vegetables.

#### **ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli ..... not detected in 1 gram;  
 Salmonella species ..... not detected in 1 gram;  
 Staphylococcus aureus.....less than 100 / gram;  
 Clostridium perferingens.....less than 100 / gram;  
 Bacillus species..... less than 100 / gram;  
 Campylobacter ( as applicable)..... not detected in 25 gram;  
 Listeria monocytogenes..... less than 10 / gram.

(Ideally this should not be detected in 25 grams but experience dictated that low levels are some times detected ).

Colony plate count .....less than 1 000 / gram;  
 Total Coliform count .....less than 200 / gram.

**NON – ESSENTIAL MICROBIOLOGICAL CRITERIA**

Yeast and mould count.....less than 1000 / gram;  
 Vibrio species ( as applicable ).....not detected in 25 grams

**EXAMPLES OF FOODS IN THIS GROUP****COOKED FISH AND COLD MEATS**

Prawns	Tuna
Sardines	Hake
Cold meats	Pate'
Crab meat	Calamari
Processed meats e.g. viennas, etc.	Ham
Polony	Snoek
Dried vegetables	Dried fish
Sliced salmon	Mayonnaise
Dried fish and vegetables	Potato salad with mayonnaise

**COLD SMOKED' OR FERMENTED MEAL ITEMS**

This applies cold items such as smoked salmon , smoked mackerel, salami and tofu

**ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli..... not detected in 1 gram;  
 Salmonella species ..... not detected in 25 grams;  
 Staphylococcus aureus..... less than 100 / gram;  
 Clostridium perferingens..... less than 100 / gram;  
 Bacillus species.....less than 100 / gram;  
 Campylobacter ( as applicable ) ..... not detected in 25 grams;  
 Listeria monocytogens..... less than 10 / gram;

(Ideally this should not be detected in 25 grams but experience dictates that low levels are some-times detected).

Colony plate count..... less than 1 000 / gram;  
 Total Coliform count..... less than 200 / gram;

**NON – ESSENTIAL MICRIBIOLOGICAL CRITERIA**

Yeast and mould count ..... less than 10 000 / gram;

**EXAMPLES OF FOODS IN THIS GROUP**

Salami  
 Cabonossi  
 Smoked fish  
 Buns, bread  
 Caviar  
 Smoked cold meats  
 Bacon

**ITEMS REQUIRING FURTHER COOKING**

This category refers to blanched vegetables, sealed meats for example steaks, rare beef and certain hot breakfast items.

**ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli .....	not detected in 1 gram;
Salmonella species .....	not detected in 25 grams;
Staphylococcus aureus .....	less than 100 / gram;
Clostridium perferingens .....	less than 100 / gram;
Bacillus species .....	less than 100 / gram;
Campylobacter (as applicable) .....	not detected in 25 gram;

**NON - ESSENTIAL MICROBIOLOGICAL CRITERIA**

Listeria monocytogens ..... less than 10 / grams.  
 (Although this should not be detected in 25 grams, Listeria monocytogens is ubiquitous and these food items would not have received sufficient heat treatment to have killed the organisms. The further cooking should kill the remaining organisms).

**EXAMPLES OF FOODS IN THIS GROUP**

Blanched and frozen vegetables  
 Half cooked meals, meat, steak, chops and wors  
 Rib basting sauce or meat basting sauce  
 Raw meat

**RAW VEGETABLES AND RAW FRUIT**

This applies to salad items and some prepared dressed salads, also uncooked fruit such as strawberries, mangoes, etc.

**ESSENTIAL MICROBIOLOGICAL CRITERIA**

Escherichia coli .....	less than 0 / grams;
Salmonella species .....	not detected in 25 grams.

**NON - ESSENTIAL MICROBIOLOGICAL CRITERIA**

Total coliform count .....	less than 200 / gram;
Yeast and mould count .....	less than 100 000 / gram.

**EXAMPLES OF FOODS IN THIS GROUP**

Tomatoes	Onions
Cucumber	Salad leaves

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Green Pepper  
Apples  
Gherkin  
Strawberry  
Avocado pear  
Cabbage  
Carrots  
Peanut butter

Pineapples  
Banana  
Salad dressing  
Mango  
Morogo, wild spinach  
Amadumbe (potato)  
Fresh fruit salad

**PRE-PREPARED SALAD ITEMS**

Prepared salads with mayonnaise, vinaigrette or similar dressing includes a range of different products. At one extreme are “higher risk” products such as those containing pasta, prawns or other protein foods. At the other, are vegetable mixes with only a light dressing. It is impracticable to categorise prepared salads into one group on the basis of their typical microbiology.

It is suggested that the criteria in other sections will apply as appropriate to the particular salad. For example, for the pasta or meat containing products, section 1.3. is the most appropriate. For vegetables in a minimum of dressing, than the raw vegetables criteria 1.6. are more applicable.

**EXAMPLES OF FOODS IN THIS GROUP**

Salad, pasta salads, chicken noodles, prawn noodles  
Salad dressings  
Chicken mayonnaise  
Potato mayonnaise salad  
Rice salad  
Mixed salad  
Beetroot salad  
Chakalaka (tomato, chilli and onion)

**GROUP OF MISCELLANEOUS FOODS**

Atchar  
Chocolate  
Halawa

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