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Summary

In the fiscal year 2063/64 B.S. (2006/7), Department of Food Technology and Quality Control has accomplished the following targets as per the approved annual program.

- In this fiscal year, 3951 food and feed samples were collected as per the Food and Feed Acts during market inspection of 45 districts from the Quality Control Division in the department, 5 regional offices and 20 food inspection units. Among them, 390 samples were found to be substandard.*
- In this year, 252 cases were filed to the respective CDO offices based on the substandard samples of last year and the previous years.*
- Food/feed industries were inspected 770 times, hotels/restaurants/sweet shops were inspected 1149 times and suggestions were given to improve the safety and hygienic condition of those industries, hotels/restaurants as well as sweet shops.*
- A total of 605 licenses of food/feed industries were renewed and 196 new licenses were issued.*
- In this year, 4 new mandatory standards (for paneer, cinnamon powder, maize and wheat) and one voluntary standard (fortified wheat flour) were approved and now they are in the process of publication in Nepal Gazette. Similarly, Code of Practice for Meat Processing Industry was developed.*
- A total number of 16,852 food/feed samples (including 8,502 for import /export certification and 200 samples for nutritional composition) were analyzed in Central Food Laboratory, five regional laboratories and four laboratories at the customs points in Kakadvitta, Birgunj, Tatopani and Mahendranagar.*
- A total of 20 post harvest trial studies were conducted in the Food Technology Development and Training Division, five Regional Food Technology and Quality Control Offices and one Apple Processing Center. A total number of 22 training programs with varying duration on different food processing technology packages were organized, where 466 possible entrepreneurs participated. Similarly, 5 training programs on Food and Nutrition were organized in Ilam and Morang with a total number of 96 women and other*

participants were trained. Technical Support was provided for the processing of 25,000 Kg Apple in Jumla district.

- *In this year, two types of recipes were developed, one study was conducted, food consumption and nutritional status survey was conducted in two communities/groups(Dhimal and Tea laborer, two seminar and mass meeting each organized, five training packages were conducted in the community and one training on HIV AIDS and Nutrition was conducted in Kathmandu and one national seminar on food based dietary guidelines was also conducted..*
- *Altogether two each posters and leaflets on nutrition; one each booklet, leaflet and poster on safety and quality; two types of leaflets on food technology and one food related act(PFA), one leaflet on “ Introduction of SPS National Enquiry Point” as well as one laboratory manual on feed and feed ingredients were published. Similarly, one tele spot (12 times telecasting) and two radio jingles (50 times broadcasting) were developed; notice on various issues of food safety and quality was published/aired 27 times through national newspapers, radio and television.*
- *At the end of this year, 65% of the construction work of both the Central Food Laboratory Building and SPS/Codex Building was completed. The rest of the work will be completed in the next fiscal year. Similarly, 90 % of the work in building construction of Regional Food Technology and Quality Control Office, Dhangadhi was completed and laboratory rooms were added in Regional Food Technology and Quality Control Office, Hetauda.*
- *A total amount of Rs.53,75,595 (in words Fifty Three Lacks Seventy Five Thousand Five Hundred and Ninety Five Rupees only)was collected as revenue for the purpose of laboratory analysis, license issue and renewal.*

A Brief Introduction of DFTQC

Background

Department of Food Technology and Quality Control (DFTQC) is one of the four departments under the ministry of Agriculture and cooperatives (MOAC) of Government of Nepal (GON). It was established in 1961 A.D. as the Department of Food in Singh Durbar, which later in 1965 was sifted to the present location of Barbarmahal, Kathmandu. In 1966, the name Department of Food was renamed as Food Research Laboratory. It became Central Food Research Laboratory in 1980 and the most of the time of it's history existed with this name. In the year 2000, the Central Food Research Laboratory was given the name "Department of Food Technology and Quality Control (DFTQC)" and became the fourth department under the Ministry of Agriculture and Cooperatives. From the very beginning, DFTQC has devoted it's efforts for ensuring the availability of safe, quality and nutritious food to Nepalese people through a number of activities in the area of food quality control, development and dissemination of food processing technologies as well as food and nutrition programs. As mandated by the Government of Nepal, DFTQC is the sole government agency to execute the food and feed acts and regulations in the country.

Vision

Ensure the availability of wholesome, safe and nutritious food for all Nepalese

Mission

Execution of laws and regulations and education / awareness to producers, traders and consumers in partnership with government agencies, industries, farmers and consumer associations

Goal

DFTQC has the following three major goals

- Ensure the safety and quality of food supply in the market
- Promote food processing industries by developing and disseminating appropriate technologies
- Improve the nutritional status of Nepalese people

Objectives

The following are the main objectives of the department

- Reduce the incidence of hazards (adulteration) related to food/feed
- Facilitate the national/international trade related to food and agriculture
- Reduce the post harvest loss through the development and dissemination of appropriate processing/preservation technologies
- Increase the establishment of small scale food industries
- Improve the knowledge, attitude and practice of consumers on food safety, quality and nutrition
- Improve the food consumption status of Nepalese people in general and of vulnerable groups and communities

Human Resource

DFTQC has a total number of 231 staff members including experts having advanced education from local as well as foreign universities in the field of food technology, nutrition, chemistry, botany and others.

Organizational Structure

Under the department, there are currently Two Divisions (Food Quality Control Division and Food Technology Development and Training Division), One Central Food Laboratory, One National Nutrition Programme, One SPS National Enquiry Point, 5 Regional Offices (Biratnagar, Hetauda, Bhairahawa, Nepalganj and Dhangadhi), 4 Food Quarantine Laboratories (Kakarbhitta, Birgunj, Mahendranagar and Tatopani); One Trivuvan International Airport Custom Inspection unit; 20 District Food Inspection Units (Jhapa, Sunsari, Saptari, Siraha, Udayapur, Dhanusha, Mahottari, Sarlahi, Chitawan, Parsa, Bara, Rautahat, Tanahu, Kapilbastu, Nawalparasi, Kaski, Dang, Bardiya, Surkhet and Kanchanpur) and One Apple Processing Unit (Jumla). The Existing structural network of the department is given in the annex-7.

Annual Progress (2063/64, 2006/07)

1. Food Quality Control

1.1. Food Inspection

1.1.1 Market Inspection and Case File

Food markets, supermarkets and industries were inspected and food & feed samples were collected as per food/feed act and rule. Altogether 3951 were collected during inspection and 390 samples (9.9 %) were found to be sub-standard where as 252 cases were filed. The detail of sample collection, substandard samples and cases filed is given in the table- 1 below.

Table-1: Summary of Market Inspection and Cases Filed

S.N.	Office	Total samples	Substandard Samples	Substandard %	Cases Filed
1	QCD, Kathmandu	1061	184	17.3	60
2	RFTQC, Biratnagar	750	22	2.9	52
3	RFTQC, Hetauda	880	111	12.6	76
4	RFTQC, Bhairahawa	460	32	7.0	16
5	RFTQC, Nepalgunj	450	14	3.1	40
6	RFTQC, Dhangadhi	350	27	7.7	8
	Total	3951	390	9.9	252

As given in the table, a maximum number of samples were collected from Kathmandu valley followed by Central Region (Hetauda) except Kathmandu valley, then followed by Eastern Region (RFTQCO, Biratnagar). Similarly, the substandard percentage was highest in the Kathmandu Valley followed by Central Region except valley (RFTQCO, Hetauda). Likewise a maximum number of cases were filed in Central Region (excluding Kathmandu valley) followed by Kathmandu Valley (QCD).

As given in the annex , based on the results of market inspection conducted by Quality Control Division, the group milk and milk products has the highest rate of adulteration (68.3%) followed by processed drinking water (44.6 %) , then by fats and oils (32.6%). Similarly, feed has a substandard percentage of 55 %. Similarly the percentage of substandard samples of last five years (based on the samples collected by food inspectors from Kathmandu Valley) shows the increasing trend with 17.3 % in the year 063/64 (2006/7), Annex-1, Fig-2 .

As given in the annex-2, the samples were collected from 45 districts. Among these districts, a highest number of samples were collected from Kathmandu Valley (District wise data for Kathmandu Valley is not available). Then the highly covered districts include Sunsari, Morang, Bara, Parsa, Chitwan, Sarlahi, Dhanusha, Rupandehi, Kaski, Dang, Banke and Kailali, where more than 100 samples were collected from each districts.

1.1.2 Industry / Hotels/Restaurants Inspection

As given in the table below, food / feed industries were inspected 770 times and hotel/restaurants were inspected 1149 times. The detail is given in the table-2, below:

Table-2 : Summary of Industry/ Hotel Restaurant Inspection

S.N.	Office	Industry Inspection (times)	Hotel/Restaurant Inspection (times)
1	QCD, Kathmandu	113	100
2	RFTQCO, Biratnagar	150	200
3	RFTQCO, Hetauda	166	347
4	RFTQCO, Bhairahawa	141	200
5	RFTQCO, Nepalgunj	100	150
6	RFTQCO, Dhangadhi	100	152
	Total	770	1149

As shown in the above table, both industry and hotels/restaurants were inspected maximum times by RFTQCO, Hetauda followed by Biratnagar and Bhairahawa.

1.2. Licensing

In this fiscal year a total number of 196 food/feed industries got a new license and 605 food/feed industries renewed their licenses. The highest number of food/feed industries received their licenses and renewed license from the Quality Control Division Kathmandu followed by Regional Food Technology and Quality Control Office, Hetauda. The detail is given in the table- 3 below.

Table 3: Summary of Licensing of Food and Feed Industry in F.Y. 063/64

S.N.	Office	New Issue	Renewal
1	QCD, Kathmandu	72	278
2	RFTQCO, Biratnagar	27	77
3	RFTQCO, Hetauda	51	124
4	RFTQCO, Bhairahawa	23	66
5	RFTQCO, Nepalgunj	8	34
6	RFTQCO, Dhangadhi	15	26
	Total	196	605

(Note: QCD: Quality Control Division, RFTQCO: Regional Food Technology and Quality Control Office)

1.3. Food Standardization

In the fiscal year 2063/64 (2006/7), 10 technical sub-committee meetings and 3 standardization committee meetings were organized. The detail of the meetings is given below.

- a. Technical Sub-Committee meetings
 - Fortified flour (Two times)
 - Fennel
 - Corn flakes
 - Carbonated water
 - Heavy metals
 - Preservatives
 - Directives on importation of refined edible oil
 - Feed (Two times)

- b. Standardization Committee meetings (3 times)

The summary list of standards so far developed is given in the annex-3.

1.4. Development of Code of Practice

In the fiscal year 2063/64, Code of Practices for Meat Processing Industry was developed. The objectives of code of practice for Meat Processing Industry are:

- To maintain hygienic condition in meat handling, processing establishments
- To provide hygienic and wholesome meat and meat products to the consumers

This code of practice includes the following aspects:

- General Principle of meat hygiene
- Establishments design and facilities
- Equipments and utensils
- Personal hygiene
- Process control
- Maintenance and sanitation
- Transportation
- Training

The different Code of Practices so far developed by the department is given below:

- i. Code of Practice for Biscuits
- ii. Code of Practice for Instant Noodles
- iii. Code of Practice for Pasteurized Milk
- iv. Code of Practice for Edible Vegetable Oils
- v. Code of Practice for Processed Drinking Water

1.5. Consumer Awareness on Food Safety and Quality

A number of activities such as notice through newspapers, radio and television, meetings, publication of booklets, leaflets and posters were carried out for the purpose of increasing awareness on food safety and quality. The activities are given below:

1.1.3 Notice dissemination

Various notices on food hygiene and safety, food adulteration, color, pesticide, preservation and food labeling were disseminated through newspapers, radio and television.

1.1.4 Mass meetings

A total number of 6 mass meetings were organized for shop keeper of small restaurant, street food shop keeper, sweet shop keepers and local shop keepers in 4 municipalities of Kathmandu Valley where a total of 360 persons participated.

1.1.5 Publication

In this year, one book (Code of Practice on Pasteurized Milk), one leaflet (Pesticide Residues) and one poster (Food Hygiene) were published.

1.1.6 Production of Tele-spot and dissemination

One tele spot on food hygiene was prepared and telecasted 12 times through television.

2. Laboratory Analysis of Food/ Feed

2.1. Analysis of Food/Feed

Central Food Laboratory, regional food laboratories and food laboratories at customs points perform laboratory analysis of food/feed for various purposes such as

- Compliance of Food and Feed Act/ Regulation
- Standardization
- Licensing (Issue and Renewal)
- Certification
- Requested and Complaint Samples
- Others

In the fiscal year 063/64 (2006/7), a total number of 16,652 samples were analyzed for various purposes. The table-4, below shows the number of samples analyzed in different laboratories under the department.

Table 4 : Summary of Food Feed Analysis in F.Y. 063/64

S.N.	Laboratory	Total Samples Analyzed
1	CFL , Kathmandu	2315
2	RFTQCO, Biratnagar	3360
3	RFTQCO, Hetauda	2614
4	RFTQCO, Bhairahawa	1777
5	RFTQCO, Nepalgunj	650
6	RFTQCO, Dhangadhi	652
7	Food Quarantine Lab, Kakadvitta	521
8	Food Quarantine Lab, Birgunj	3995
9	Food Quarantine Lab, Tatopani	503
10	Food Quarantine Lab, Mahendranagar	265
	Total	16652

(Note: CFL: Central Food Laboratory, RFTQC: Regional Food Technology and Quality Control Office)

Among the total analyzed samples, 8465 samples were analyzed for the purpose of import certification including 5284 samples at Food Laboratories at 4 customs points i.e. Kankadvitta, Birgunj, Tatopani and Mahendranagar and 3181 samples at Regional Food Technology and Quality Control Offices Biratnagar, Bhairahawa, Nepalgunj and Dhangadhi.

2.1.1. Analysis of Food/ Feed at Central Food Laboratory

Altogether 2315 samples of various food and feed samples were received and analyzed in Central Food Laboratory of the Department of food Technology and Quality control (DFTQC) in the fiscal year 2063 /2064 for various analytical purposes. The samples were analyzed based on the request of the senders and the purpose of the collection accordingly. Number of the sample analyzed for the different purposes are as follows:

- Compliance of Food and Feed Act/ Regulation -1061
- Standardization - 123
- Licensing (Issue and Renewal) - 447
- Certification -37

- Requested and Complaint Samples -572
- Check Samples -10
- Regional Laboratory –Food/ Feed -65

All the received samples were tested for various categories. Some of the categories include nutrient contents, quality parameters, preservatives, additives and also for contaminants like pesticide residues, aflatoxin, heavy metals (e.g. lead, Cadmium, Nickel), radio activity and microbial contamination.

Samples of different food and feed commodities received in this department from different sources are first registered in the sample reception unit. Then based on the information of the document associated with each of the sample received, the registration unit puts respective code number to each of the samples and forwards the samples to Central Food Laboratory. Upon reception of the samples as forwarded by reception unit, Central Food Laboratory makes plan of analysis based on the nature of samples as well as requested parameters to be analyzed and proceeds for the actual laboratory works. Analysis progress report of these samples is presented in different headings.

The detail of analytical results in the Central Food Laboratory is given in the annex. The summary of the results is given in the table-5, below:

Table- 5: Summary of Analysis Results in Central Food Laboratory

S.N	Food Groups	Total Samples*	Sub-Standard	% Sub-Standard
1	Milk & Milk Products	80	30	37.5
2	Fats & Oil	299	58	19.4
3	Sweets and Sweeteners	88	24	27.3
4	Fruits and Vegetable Products	195	68	34.9
5	Cereal and Cereal Products	454	25	5.5
6	Tea, Coffee and Spices	325	19	5.8
7	Salt	23	5	21.7
8	Processed Drinking Water (Microbiology)	167	73	43.7
9	Processed Drinking Water (Chemical)	154	50	32.5
10	Grading	150	1	0.7
11	Food Additives(Color)	85	12	14.1
12	Miscellaneous	76	29	38.2
13	Food Hygiene	234	156	66.7
14	Contamination (Aflatoxin, Pesticide Residues, Heavy metals)	196	2	1.0
15	Feed and Feed Ingredients	94	43	45.7
	Total	2620	595	22.7

(Note : * The total number of samples include the samples analyzed in different laboratories. A single sample can be analyzed in different laboratories counting more than one sample.)

a. Milk and milk products

Altogether 80 samples of milk and milk products were analyzed. The analysis result revealed that out of 50 samples of fluid milk analyzed, 26 samples were found substandard both in Fat and SNF. The details of the product analyzed are shown in the Table 1, annex-4. Similarly 30 samples of milk products such as Skimmed milk powder, Ice cream, Paneer, Yoghurt, Cheese, Khoa, Chhurpi, Condensed milk, Dairy whitener, Cerelac were analyzed. The detail analytical data is shown in Table 2, annex-4. Only 2 sample of Skimmed milk powder out of 7 samples were found substandard due to low protein percentage and 1 sample of condensed milk out of 5 samples was found substandard due to low SNF percentage.

b. Fats and Oil

Altogether 299 numbers of fats and oils samples were received in the laboratory. Among them, 115 samples were of rap seed and mustard oil, 39 samples of soyabean oil, 42 samples of vegetable ghee, 46 samples of ghee , 11 palm oil, 33 sun flower oil, 2 palmolein oil, and 11 samples of different types of oils, used vegetable oils, corn oils, pudin hara pearls, soya lecithin oil, seeds and 33 samples of sunflower oils.

A total number of 58 samples of fats and oils were found to be substandard shown in Table 3, annex-4. In case of mustard oil and rapseed oil substandard is due to the contamination of argemone , unidentified color, high acid value and iodine value. High peroxide value was observed in soybean oil and sunflower oil. In case of ghee substandard was due to the high refractive index, high acid value, moisture and low RM value and sesame oil positive. Melting point high and sesame oil negative in case of vegetable ghee observed. Most of the vegetable ghee was found to be substandard due to high melting point and negative sesame oil test.

c. Sweets and Sweeteners

Altogether 88 samples of sweet and sweeteners were received in the laboratory. Among them 24 samples were found substandard. Detail analytical data were presented in the Table 4, annex-4.

d. Fruits and Vegetable Products

Altogether 195 samples of fruits and vegetables were analysed. out of 30 samples of Tomato ketchup and chili sauce analyzed , 27 samples were found substandard due to low TSS and acidity. In case of 49 samples of pickles, 21 samples were found substandard due to low acidity and high benzoic acid (preservative) , . Similarly in case of squash, juice, and sarbat, out of 116 samples, 20 samples were found substandard due to low acidity, low TSS, and color (> 300 ppm in orange squash (more than one color). Details of results were given below in the Table 5, annex-4.

e. Cereal and Cereal Products

Altogether 454 samples of cereal and cereal products were analyzed. Among them 25 samples were found substandard. Summary of analysis report of cereal and cereal products is given in Table 6, annex-4.

f. Tea and coffee

Altogether 91 samples tea, herbal tea and coffee were analyzed. Among them three samples of tea were found substandard due low caffeine. Analytical details are given in Table 7, annex-4.

g. Spices

Altogether 234 samples of spices (chilly, turmeric, coriander, mix masala, cumin, pepper, Small cardamom and cinnamon) were analyzed. Out of them 16 samples were found substandard. Eleven samples of mix masala were found substandard. Analytical details are shown in Table 8, annex-4.

h. Salt

Twenty three common salt were analyzed, out of them five salt sample were substandard due to low iodine content and water soluble particles. Analytical details are shown in Table 9, annex-4.

i. Processed Drinking Water

Altogether 154 samples of mineral and drinking water of different brand were analyzed for chemical parameters. 50 samples were found substandard due to high PH, high ammonia and high Iron. Similarly 167 samples of processed drinking and drinking were analyzed for hygienic quality. 73 samples were substandard due to high total mesophilic bacterial count, coli form, faecal coli form, E.coli, Bacillus and yeast and mold count. Salmonella, Shigella, Vibrio cholera and Clostridium were absent in all samples.. Detail result is shown in Table 10, annex-4.

j. Grading

A total of 150 samples were graded. Among them only 1 sample were found substandard. The summary of grading result is presented in Table 11, annex-4.

k. Food Additives

Altogether 85 samples of different varieties of sweets and other samples were analyzed for color test. Among them 12 samples were found to be sub-standard. Details analysis results are shown in Table 12, annex-4.

1. Miscellaneous Sample

Altogether 47 samples of different food varieties and 29 samples of Lito were analyzed for Moisture, Fat, Protein, Total ash, Acid insoluble ash, Acidity, Crude fiber, Carbohydrate, Energy, Calcium, Phosphorus, Iron and Vitamin content. All the samples of Lito were found substandard due to high Moisture, Crude fiber and Acid Insoluble Ash percentage (Standard PFA). Detail analysis report is shown in Table 13, annex-4.

m. Food Hygiene

Altogether 455 samples of different food commodities (Milk and milk products, Cereal and cereal products, Meat and meat products, Bakery products, Herbal tea, Instant noodles, sweets, jam, soup, snacks food, mayonnaise, Pickles, Gunruk Snack foods, Taste maker, Soft drinks, Masuara, Tomato Ketchup, Miscellaneous samples, Mineral water and Processed drinking water (sealed and bottled) and Drinking water (unsealed) were analyzed for their hygienic quality. Contamination was found in 164 samples. Microbiological analysis results of milk and milk products shown in Table 1 and 2, Microbiological analysis of drinking water is shown in Table 10. Altogether 234 samples of different food products, 156 samples were found sub-standard. The detail analytical results were given in the Table 14, annex-4.

n. Contaminants

Radiation

Altogether 44 samples of food were received to measure the radiation contamination. A Bequerel Monitor LB 200 was used for the gamma activity level measurement. The maximum radiation level was found 180 Bq /Kg in Hop pallet, which was below the permissible level of 300 Bq/ Kg prescribed by Nepal Government. The radioactivity level was within the safe limit in all the tested food items. The detail is given in the table 15, annex-4.

Aflatoxin

Altogether 53 samples of various types of food, animal feed and fed ingredients were analyzed for the detection of Aflatoxin B₁ & B₂. The samples were analyzed by Thin layer chromatography method. Estimation was made in the comparison of the fluorescence of samples spot with the fluorescence of standard. Out of 53 contaminated samples, 2 samples were found to be contaminated with Aflatoxin B₁ and B₂. The no of samples and level of Aflatoxin B₁ and B₂ are given in Table 16, annex-4.

Pesticide Residue

Altogether 58 samples of different food commodities were received for the detection and estimation of pesticide residue. The samples were analysed by Thin layer chromatography for organo chlorine (DDT &

BHC) and organo phosphorous (Parathion, Methyl Parathion & Malathion) pesticides. All the samples, received for the detection & estimation of pesticide residue of organo chlorine (DDT &BHC) and organophosphours (Parathion, Meltyl Parathion and Malathion) were not found contamination of pesticide residues. The results are given in Table 17, annex-4.

Heavy Metals

Altogether 41 samples of different commodities were analyzed for heavy metals. Heavy metals analyzed were Sodium, Potassium, Calcium, Chromium, Manganese, Magnesium, Iron, Nickel, Copper, Zinc, Arsenic, Cadmium, Lead, Bismuth. Heavy metals were not detected in any one of the samples shown in Table 18, annex-4.

o. Feed and Feed Ingredients

Altogether 94 samples of feed and feed ingredients were analyzed for quality control and standardization purposes. Among them 64 samples were poultry feed, 8 were cattle feed. Similarly 22 samples were feed ingredients. Out of 72 feed samples, 43 samples were found to be inferior in quality due to low protein, low fat, high moisture, and high salt content. Analytical details of different types of poultry feed, cattle feed, and pig feeds as well as feed ingredients were shown in Table 19, annex-4.

2.2. Laboratory Quality Assurance (Reference laboratory)

Quality assurance is the sum of organized plans and actions made with the objective of ensuring quality required for their intended use. It plays pivotal role in the production and supply of quality food products. Assurance of quality of laboratory works can be achieved by adopting Good Laboratory Practices. It comprises participation in proficiency testing programme, Calibration of equipment and volumetric glasswares, skill of personnel, methods of analysis, validation of methods, use of Reference Standards and Reference materials.

2.2.1. Check sample analysis

Proficiency test is a quality assurance tool for checking the competence of a laboratory. The main goal of this program is to assess the accuracy of test results for the participating laboratories. It helps to identify the possible errors existing in specific laboratories and share the information for harmonization of testing procedure. As lack of uniformity in the Laboratory test results of Oil and Litto (Weaning Food) reported by various laboratory was observed in the program of previous year, check samples of Oil and Litto (Weaning Food) were prepared and sent to the regional and quarantine laboratories, NBSM and DDC. The results are presented in the tables 1 and 2, annex-5.

2.2.2. Updating of Laboratory Manual

Laboratory manual is a basic tool for the harmonization of laboratory testing procedure. It reduces discrepancies in procedure of analysis from one laboratory to another as well as variation from the real value. Viewing these, Reference laboratory has updated existing manual of Feed and Feed ingredients. Emerging changes are incorporated in the Manual make it better. The following steps were followed:

- Incorporation of the received inputs from the experts.
- Preview of existing manual in detail.
- Discussion with experts on the concerning issues and difficulties for their inputs.
- Consultation of AOAC, Codex Alimentarius Commission and other related documents.
- Pretest of the manual by the experts.
- Final approval by the experts.

2.2.3. Volumetric Glassware Calibration

Accuracy of test results solely depends on use of calibrated equipment and volumetric glass wares. The detail of the calibrated equipments/ glassware is given in the table-6, below.

Table -6: Calibrated equipments/glassware

S.N.	Name of equipments	Qty	Calibrated from
1	Volumetric flask 100 ml	2	NPL, India
2	Volumetric flask 250 ml	2	NPL
3	Volumetric flask 500 ml	2	NPL
4	Burette 1-50 ml	2	NPL
5	Pipette 1 ml, 2 ml, 5 ml, and 10 ml	2 of each	NPL
6	Weight Box 10 mg to 100g	1	NPL
7	Thermometer 1-100°C	7	NBSM, Nepal
8	Thermometer 200-250°C	1	NPL, India

(Note: NPL- National Physical Laboratory; NBSB – Nepal Bureau of Standards and Metrology.)

2.3. Research and Development

2.3.1. Quantification of Monosodium Glutamate (MSG) :

Since MSG is used as flavor enhancing food additive, literature showed no health risk up to level of its palatability. Its flavor is self limiting in food similar to table salt. It is also found as supplement of table salt. All natural foods and readymade foods contain free glutamate in different concentrations .More over, it is found mostly in protein containing foods.

Separation of glutamate from foods is one of the challenging task and here, it was done by using cat ion-ion exchange column of Dowex -50W * 8 (H form) 100-200 mesh and estimated by formol potentiometric titration using 0.1 N NaOH. Recovery range was found satisfactory (=90%). One of

the major draw backs of this method is that separation of glutamate takes very long time (6hr) and electrode must always be calibrated and in a good condition.

2.3.2. Detection of Antibiotic Residues in Chicken Meat

One hundred and thirty samples of chicken meat (muscle, skin, gizzard, liver & heart) were collected and analyzed. A total number of 100 samples were collected from antibiotic treated chickens, 10 samples from untreated chickens and 20 samples from different meat shops. 20 chicken were orally fed with tetracycline hydrochloride antibiotic at dose 2g / liter water for 7 days. These samples collected were processed using microbiological assay method and residues were detected by four plate test method. Collected samples were immediately cooled at -20 0c and piece of frozen meat were screened on different pH of culture medium seeded with Bacillus subtilis and Staphylococcus aureus. Out of 130 samples, only 45(35%), that were treated with tetracycline, had detectable tetracycline residue showing zone of inhibition.

Out of 45 samples, with detectable tetracycline residues, 12 (27%) were muscle samples,3 (7%) were skin,14(31%) were gizzard,12(27%) were liver and 4(9%) were heart samples. Residues were not detected in meat samples of market and controlled samples of chicken. This study indicates that the presence of tetracycline residues were detected only in antibiotic treated samples up to 12 days of withdrawal periods.

2.4. Training on Laboratory Analysis Technique

Training on laboratory analysis technique was conducted. The training conducted twice in this fiscal year. The training was one week programme having 15 technical assistants from central, regional as well as quarantine laboratories of one week. Training was held on the analysis of fruits and vegetables.

2.5. Monitoring of Laboratories

Regional laboratories such as Hetauda, Bhairahawa, Nepalgunj and Dhangadi as well as food laboratories at customs points such as Birgunj, Kakadvitta, and Tatopani were monitored during this fiscal year.

2.6. Publication of Laboratory Document

Laboratory Manual on “Feed and Feed Ingredients” was published.

3. Food Technology Development & Training

In the fiscal year 2063 / 064, Food Technology Development and Training Division under the Department of Food Technology and Quality Control has implemented the following programs:

3.1. Food Technology and Post-harvest Program

3.1.1. Study on the Post Harvest Loss of *Akabare* (*Capsicum annuum L. var cerasiforme*

Irish)

Akabare (Cherry Chilly) *Capsicum Annuum L. var cerasiforme*, one of the very hot and high valued chilly is highly perishable and available only for short period during the month of Bhadra to Kartik especially in the Eastern part of the Nepal.

Chilly fruits show climacteric behaviour as long as they are attached to the plant, but when detached is non-climacteric. Green or deep green harvested fruit fails to fully colour red, while fruit that are harvested at or after the colour break stage visually complete their red colour development within 7--9 days. The fruits are sensitive to Ethylene and to chilling injury when stored below 10° C.

Fresh *Akabare* were bought from Illam bazaar. Information on harvesting and transportation methods used by farmers were gathered. The length (the greatest length measured in a straight line parallel to the longitudinal axis, excluding the stem) and width or diameter (the greatest dimension measured at right angles to the longitudinal axis) was measured using a vernier caliper. The weight of 100 pods was noted.

The *Akabare* were packed into fiber board carton boxes with or without primary packaging [paper or Polyethylene (PE)]. Each box was filled with 2 kilograms of *Akabare*. The boxes were stored at ambient condition and weight loss due to transpiration and decay were noted at different time intervals, until the loss reached 30 percent.

Effect of different packaging materials has not much effect on the post harvest loss of *Akabare*. The effect of storage condition was much pronounced as higher percentage of loss was noted at the storage condition of higher temperature coupled with lower relative humidity.

3.1.2. Study on hygienic and chemical quality of dried fish

This study was carried out to study the hygienic and chemical quality of locally available dried fish samples available in market and to prepare and shelf-life study of the dried fish samples of local variety of fish '*Naini*' (*Cirrhinus mrigala*).

Microbial and chemical analysis of dried fish samples of prepared as well as market samples was done. Shelf life study of prepared fish was performed for six months at ambient condition. Raw material (fresh fish) was collected from Kalimati fish market. Fish was prepared for drying by washing, descaling, and removal of gills, degutting and washing. Salting was done by dry salting (2 and 3 % on fish wt. basis) method and kept in chilling temperature for 24 hrs. Next, fish was dried and smoked in cabinet dryer at 60°C for 12-16 hrs. Dried Fish were packed into Polypropylene bag (200 gauze) and stored in dry and cool place.

Out of 8 dried fish samples collected from market, 4 samples were found contaminated with Coliform of which 2 were also found positive with *E. coli*. Two market samples were also contaminated with *Salmonella*. Four samples showed infestation with insects and their larva whereas one of the samples showed green mold growth during storage inside package. Seven samples have acid insoluble ash (AIA) >1%. The prepared dried fish samples did not showed presence of Coliform and other pathogens and also AIA content < 1%.

Among the dried fish, salted samples did not show any spoilage within 6 months of storage when packed in PP and stored at ambient condition whereas unsalted samples were found spoiled due to mold growth. Thus from this study, it can be concluded that dried fish with satisfactory hygienic quality can be prepared and which can be stored at ambient condition for up to 6 months.

3.1.3. Study on Grading, Packaging and Storage of Okra (Lady's finger)

In Nepal, mainly two varieties *Pusa Sawani* and *Parvati* are grown. *Pusa Sawani* is usually grown in the Terai belt whereas the *Parvati* in and around the mid hills. Nepalese Okra (*Parvati*) was graded according to its length into four different classes, Extra [$l > 6 / (15.24)$], Large [$l > 5 < 6 / (12.7-15.24)$], Medium [$l > 3.5 < 5 / (8.89-12.7)$] and Small [$l > 1.75 < 3.5 / (4.45-8.89)$] after the removal of over matured and fibrous pods from the lot. The graded pods were packed into different packaging materials LDPE (150 gauge) or newspaper and placed into perforated basket (PE) and stored at different conditions, ambient, evaporative condition with natural air flow and refrigerator. The storage condition (temperature and relative humidity) were found to have an immense impact on weight loss due to transpiration. Reduction of storage temperature (by 10°C and increment of relative humidity (by 25%) led to reduction of weight loss by more than 100 percent. Wrapping in paper or LDPE delayed weight loss but LDPE led to accumulation of condensate which finally led to pod decay. Storing without packaging aid led to the highest weight loss. Also, the physiological (maturity) state of pods had an impact on storage loss. Tender pods having high rates of respiration lost weight faster than the matured pods but at the same time, the tender pods remained tender for longer period during storage.

The okra wrapped in paper prior to packing into the perforated basket or LDPE led to reduction of weight loss due to transpiration. Also, it acted as absorbent for the condensate, which in turn reduced the loss due to decay. Occasional change of paper was necessary.

Though immature pods lost weight due to transpiration faster than matured pods, they remained tender for longer period than matured pods. This might be due to immature pods having higher respiration rates. Proper packaging materials coupled with the proper storage conditions (R.H. & Temp.) can extend the shelf life up to a certain extent.

3.1.4. Grading and Storage Study of Bell Pepper/ Sweet Pepper

The study was carried out to study the grading and storage of sweet pepper. The fresh samples of Bell pepper were bought from market and graded according to United States Standards for grades of sweet pepper. U.S. grading system into the following grades:

U. S. Fancy consists of mature green sweet peppers of similar varietal characteristics which are firm, well shaped, and free from sun scald, freezing injury, decay and from injury caused by scars, hail, sunburn, disease, insects, mechanical or other means. The minimum diameter of each pepper shall be 3 inches and the length shall be not less than 3 1/2 inches.

U. S. No. 1. consists of mature green sweet peppers of similar varietal characteristics which are firm, fairly well shaped, and free from sun scald and decay, and free from damage caused by freezing injury, hail, scars, sunburn, disease, insects, mechanical or other means. The diameter and, length of each pepper shall be not less than 2 1/2 inches.

U. S. No. 2. consists of mature green sweet peppers of similar varietal characteristics, which are firm, not seriously misshapen, free from sun scald and decay, and free from serious damage caused by freezing injury, hail, scars, sunburn, disease, insects, mechanical or other means; there are no size limitations.

The samples were stored in room temperature (30°C and R.H. 70%), Cool chamber (22°C and R.H. 95%) and refrigerator (5°C and R.H. 48%) with two packaging systems (basket storage and PE packaging) and the shelf life was studied by sensory observation.

From the study, it was observed that only one pepper fall into US Fancy grade, 10.51% sample fall into US No.1 grade, 73.18% sample fall into US No. 2 grade and 16.31% sample were sorted out due to substandard in all the grades. Among US No.2 grade sample, 54.48% sample were larger than 2 inch in both diameter and length and 45.52% sample were smaller

than 2 inch in both diameter and length. From ANOVA analysis, the effect of storage variation was significant on shelf life at 5% level of significance but the effect of packaging and the combined effect of storage and packaging were not significant on shelf life at 5% level of significance. The maximum shelf life was 11 days packed in basket and stored in refrigerator.

3.1.5. Product Development from Under Utilized fruits (*Amala and Sea buckthorn*)

Processed Amala products

Amala (emblica officinalis or *Phyllanthus emblica*) is a medium sized deciduous tree of *Euphorbiaceae* family. *Amala* is sour in taste. The fruit is nearly spherical, light greenish yellow, quite smooth and hard on appearance. The fruit ripens in autumn season.

Following products were developed from *Amala* fruit: *Amala* murabba, *Amala* titaura, *Amala* pickle and *Amala* powder. Process optimization, recipe development and storage study were done to each type of product. From this study, it was concluded that processed product prepared from the *Amala* were found very satisfactory in quality.

Product Development based on Sea buckthorn

Sea buckthorn (*Hippophae rhamnoides*) belongs to family *Elaeagnaceae*. This plant is distributed from Himalayan regions including India, Nepal, Bhutan, Pakistan (Skardu, Swat, Alight) and Afghanistan, to China. Mongolia, Russia, Kazakhstan, Hungary, Romania, Switzerland, Germany, France and Britain and northwards to Finland, Sweden (Jeppsson, 1999) and Norway (Yao, 1994). Sea buckthorn berries are known to be acidic not very sweet berries with a mild unique aroma. High contain of vitamin C, fluorides, oils and oil soluble, bio active compounds and minerals. Many health claims associated with Sea buckthorn such as preventive effects against flu, cardiovascular problems, mucosa injuries and skin problems.

The objective of this study was to develop value added products like squash from Sea buckthorn fruit. The juice of Sea buckthorn fruits in semi processed form (preserved by chemical method) were brought from Mustang district to FTDTD, Kathmandu and squash was prepared by adding sugar and water to Sea buckthorns juice. Product prepared from the seabuckthorn was found acceptable.

3.1.6. Study on the removal of mucilage layer on outer shell of walnut

Walnut (*bft/ cf/v/*) from Mustang district were brought to DFTQC. The objective of this study was to develop appropriate method for the remove of the black dried mucilage layer and bleach the outer shell of the nuts to

attractive bleached colour. Following methods were used to remove the mucilage layer:

- minute dipping in hot alkali solution (2%) gave the best result for the complete removal of black deposits and bleaching shell.
- Treatment with hypochlorite and peroxide solution also showed satisfactory result comparable to alkali treatment.
- Washing with hot water can also be used to remove black deposit but no bleaching action

Further Study on the process optimization for bleaching, effect of treatment on the storage stability as well as proper harvesting methods need to be done.

3.1.7. Study on Apricot (*Khurpani*) drying

This study was carried out in collaboration with Horticulture Research Centre, Kirtipur. Apricot is found in abundance in Mustang district but harvesting season is very short period of time during the month of Shrawan and is highly perishable. Apricots were brought from Mustang district to study on improved method of apricot drying. Apricot after halving and destoning were treated with Potassium metabisulphite (sulphiting process to control the browning) and then dried in a mechanical dryer at 60°C for 10 to 12 hours. Dehydrated products were bright yellow in colour but slightly tough in texture.

3.1.8. Problem Identification and status survey of Big Cardamom quality and its production technology in Eastern Region of Nepal

Food Research Officer from FTDTD (Food Technology Development and Training Division) went to field visit to Ilam, one of the major cardamom producing district in the Eastern region of Nepal on 16 Sept 2007 to 29 Sept 2007. During the visit, coordination with different GOs, NGOs and INGOs along with farmers and processors were made to collect real picture of the problem and the existing situation regarding cardamom production and processing technology. Findings of the visit are as follows:

Major organizations working in the field of cardamom are: Cardamom development center, GON, Fikkal, Sungava Club, SNV project, Rural entrepreneurs help program, REDC, NCDC, RRN etc.

Existing situation, Problems and Quality: Cardamom development centre, although being the main body working in the field of cardamom from government sector, is not focusing its work in the field of processing technology development and dissemination and carrying out its work in the agriculture point of view only.

Although, lots of Research and Development have been carried out very long time before, dissemination to the farmers and processors level seems to be weak. Traditional dryer, though very less efficient along with giving rise to low quality products, are still being used in the rural areas and contribute significant amount in the production.

Dissemination of two drum and six drum dryer developed by technical support of CFRL, now DFTQC, seems to be very weak. Six drum dryer is totally not being used and two drum dryer seems to be utilized in some places. In fact, they felt some problems in these dryers also like more labor requirement due to the necessity of timely change of tray position, less wood efficiency than traditional dryer, higher installment cost etc. Modified form of two drum dryer with indirect heating and single tray in the top like in the traditional dryer is popular there. More research and developments seems to be necessary understanding the existing problem.

Dryer with gassifire technology has been developed but quality of cardamom produced from it has not been analyzed. This dryer seems to produce good quality of cardamom like in indirect heating system but further research needs to be carried out. This dryer is not being used and not accepted yet by farmers due to higher installment cost.

Solar dryer was tried previously by Sungava club in Pashupatinagar but due to insufficient solar light, it failed. Due to less use of improved dryer, cardamom dried by traditional method still contribute significant amount in the market.

The work carrying out by Sungava club and SNV in the field of cardamom was appreciable. Sungava club has made an umbrella group of 35 farmers and is running 8 improved dryer in Pashupatinagar and SNV made 9 improved dryer in the last fiscal year and produced 10 Mt. of good quality cardamom. SNV is going to install 32 new improved dryer to handle with 44 farmer groups and aimed to produce 500 Mt. of good quality dryer. They are also helping in the marketing of good quality cardamom produced by their groups.

3.1.9. Technical problem identification of processed food industries (Potato Chips and *Dalmoth*)

In order to determine the causative factors of technical problems arising during processing and to identify them, a survey was conducted in potato chips and factories in the fiscal year 2063/2064 throughout the nation in the following factories using the questionnaire model and random sampling of products from factory and local market. Questionnaires were developed according to the nature of the factory, filled at the factories. Gathered information was analyzed on the basis of applied technology,

qualified manpower hired, factory location, construction & lay out, sanitation etc.

- Chaudhary Food Products
- Shiv Om food products
- Pathak Food Products
- KC Food Products
- Bolbam Food Products
- Khanal Food Products
- Swadilo Food Products
- Joshi Bhandar
- Shiva Bhawani Dalmot Bhujia Udyog
- Bimal Food products
- Mahalaxmi snacks

Following problems were compiled from the survey done in the Potato chips and Dalmoth factories:

i. **Rancidity:**

Rancidity problem is prevalent in all the industries. The reasons for this problem are

- **Choice of oil:** Improper choice in the use of oil for deep frying. Soybean oil is being utilized extensively but it is not stable from the rancidity point of view. Mustard oil is also not suitable. Proper choice of oil for frying purpose is necessary to be done for frying purpose.
- **No antioxidant being used:** Antioxidants are not being used in any industry. Frying reduces the stability of oil and hence proper use of antioxidant is necessary.
- **Packaging Material use.** Most of products were packed in transparent PP pack. Light enhances the rancidity. Hence, metallic wrapper is necessary to be utilized.
- **Metallic contamination:** Iron is being utilized extensively in the machineries which is pro-oxidants and increases the rancidity. Even copper, a strong pro-oxidant being utilized and increases the rancidity. Stainless steel should be utilized for better results.

ii. **Moisture uptake and loss of crispiness**

The packaging being utilized is not sufficient and sealing is not good. BOPP should be used, better metallized BOPP for better results.

iii. **Darkening of potato chips**

None of the industries are using the sulphitation procedure which is a best method to control browning. Even blanching is not being done in most of the industries.

iv. **Good Manufacturing Practices and Good Hygienic Practices are not sufficiently implemented**

Hygiene and sanitation needs to be improved.

v. **Lab facility**

Neither laboratory facility neither was available nor is lab testing practiced in any of the factory surveyed to control raw material and finished product quality.

3.1.10. **Other Studies :**

The list of other studies conducted in the Regional Food Technology and Quality Control Offices is given in the table-6, below. The detail study reports are available in the reports of respective office reports.

Table- 6: Summary of other Post Harvest Studies

S.N.	Name of the study	Study conducted in
1	Processing Technology of Arecanut	RFTQCO, Biratnagar
2	Use of Pesticide in Tea	RFTQCO, Biratnagar
3	Preparation of Ash gourd murabba	RFTQCO, Hetauda
4	Preparation of Ash gourd candy	RFTQCO, Hetauda
5	Preparation of Brahmi (Ghortapre) Squash	RFTQCO, Hetauda
6	Preparation of Plum Appetizer	RFTQCO, Hetauda
7	Shelf life study of mustard oil	RFTQCO, Bhairahawa
8	Product development from <i>Bhakimlo</i> cherries	RFTQCO, Nepalgunj
9	Proximate composition of <i>Chuk</i>	RFTQCO, Dhangadhi
10	Preparation of juice and effectiveness of preservative of storability	Apple Processing Center , Jumla
11	Preparation of lather (<i>mada</i>) from plum	Apple Processing Center , Jumla

3.2. **Training program:**

DFTQC has been conducting training program with an aim to generate self-employment, enhance food safety, food availability through processing and income generation leading to poverty reduction targeting especially women, farmer and the unemployed youth as well as to promote food processing industries in Nepal. In this fiscal year altogether 22 training programs were conducted in the department, 5 regional offices and Apple Processing Center, Jumla with 466 participants, most of them women. The detail is given in the table below :

Table-7 : Summary of Food Processing Trainings

Office	No. of Training	Participants		
		Male	Female	Total
FTDTD, Kathmandu	8	80	106	186
RFTQCO, Biratnagar	2	1	39	40
RFTQCO, Hetauda	2	3	37	40
RFTQCO, Bhairahawa	2	11	29	40
RFTQCO, Nepalgunj	2	5	35	40
RFTQCO, Dhangadhi	3	13	47	60
Apple Processing Center, Jumla	3	29	31	60
Total	22	142	324	466

The different training packages conducted in the Food Technology Development & Training Division, Babarmahal, has been presented in the table below.

Table-8 : Training conducted by FTDTD

SN	Subject	Duration	Place	Total No. of Participants	% of Male Participants	% of Female Participants
1	Fruit Processing Technology	7 days	Kathmandu	24	58	42
2	Sauce/Pickle Processing Technology	7 days	Kathmandu	25	28	72
3	Snack Food Technology	10 days	Kathmandu	25	44	56
4	Food Processing Technology	30 days	Kathmandu	25	20	80
5	Food Processing Technology	7 days	Dolpa	25	0	100
6	Food Processing Technology	7 days	Humla	25	32	68
7	Product Development and Diversification of meat	3 days	Kathmandu	17	70	30
8	Product Development and Diversification of meat	3 days	Kathmandu	20	90	10

3.3. Publications:

Two types of leaflet entitled Potato Chips Technology and Mixed Pickle Technology were published.

3.4. Consultancy Services:

During the fiscal year 2063/64(2006/2007), technical consultancy services related to food processing were provided to 22 different entrepreneurs, interested individuals and organizations from different districts. The consultancy services provided mostly were on different areas of food processing such as squash technology, product development (apple, bael, tight orange, papaya), dried meat, pickling, candy/ mada production, chemical preservation methods, fermentation, bulk storage method, candy technology, noodle making as well as on the use of packaging materials, food colours, and preservatives.

3.5. Purchasing of Machineries/ Equipments:

In the fiscal year 2063/64(2006/2007), the Food Technology Development and Training Division received the following machines and equipments so as to strengthen its capacity for Research and Development activities. The equipments procured include Nitrogen Filling Machine and Vernier Caliper one set each and sealing machine 2 sets.

3.6. Other Activities:

3.6.1. Participations in Exhibition

DFTQC participated in the "Nepal Science and Technology Expo 2007" supported by The Ministry of Environment, Science and Technology, Government of Nepal, Council of Technical Education and Vocabulary Training (CTEVT), Nepal Academy of Science and Technology (NAST) from June 7 2007 to June 9 2007 for 3 days at Bhrikuti Mandap, Kathmandu. During the exhibition period, wooden models of solar dryer, cellar store, Zero energy cooling chamber, Cardamom dryer; publications (books, booklets, leaflet) of the DFTQC, posters about food processing, nutrition, food safety, quality control, information about SPS inquiry point, ; processed food products produced during training program were also exhibited. The staffs of the department were convoluted and the activities of the department were described by the technical staffs from DFTQC and RFTQC, Biratnagar to the interested persons and parties.

4. Food and Nutrition Development

Under the National Nutrition Programme, the following activities were conducted in the fiscal year 2063/64 (2006/7)

- Food and Nutrition analysis
- Food and nutrition research and development
- Food and nutrition education and communication
- Community nutrition improvement program
- Training on HIV/ AIDS and Nutrition
- National Seminar on food based dietary guidelines

4.1. Food and Nutrition analysis:

Altogether 200 samples were analyzed for their nutrient content. Classification of analyzed samples is presented in the table below and the result of the analysis is give in the annex.

Table-9: Types of foods analyzed for nutrient content

<i>Food items</i>	<i>No. of sample</i>	<i>Food items</i>	<i>No. of sample</i>
Meat products	11	Ari	1
Cereals	12	Papad	1
Biscuits	19	Pizza triangles	1
Fish	15	Ground apple	1
Vegetables	37	Noodles	2
Mo: Mo	37	Kurkure	2
Legumes	9	Rice vermicelli	1
Mushroom	11	Aloo bhujiya	1
Lito	7	Bhujiya dalmoth	1
Sisnu powder	13	Aloo powder	1
Soup powder	3	Noodles masalsa	3
Juices	2	Herbo max powder	1
Cerelac	1	Herboprassa	1
Corn flakes	1	Bael	2
Sohan papdi	2	Sesame Seeds	1

4.2. Food and Nutrition Research:

4.2.1. Nutritional Value of Momo available in Kathmandu Valley

Momo is one of the popular foods available in different categories of restaurant in Kathmandu valley. It was first invented in China. It is a quite popular snack among all age groups of people. When it was introduced to Nepal, momos were used to be made by using buffalo meat (Buff). Now, a variety of momos viz. chicken momo, buff momo, paneer momo, veg momo and mixed veg and paneer momo are available in the market.

Momo samples were collected from different location of Kathmandu Valley. The nutritional value was analyzed in the laboratory.

On the basis of results, buff momo was found to be highest (10.52%) in protein content where as veg momo was found to be lowest (4.3%) in protein content. Fat content was found highest in paneer momo (13%) and

lowest in veg momo (2.95%). Paneer momo was found to contain the highest (255.11%) energy content and veg momo was found to contain the lowest (155.85%).

Similarly, the nutritive value per plate is also given in the table below:

Table- 10: Nutritive value of different momos calculated as per plate basis

Type of Momo	Protein gm	Fat gm	Carbohydrate gm	Energy Kcal
Veg.	9.56	6.53	62.93	344.59
Chicken	23.45	18.37	55.51	523.28
Buff	23.69	20.05	62.81	529.22
Paneer	22.12	28.59	53.74	561.24

The above table shows that buff momo has the highest protein content per plate followed by chicken momo, then by paneer momo. Similarly, energy content was found highest in paneer momo followed by buff momo, then by chicken. Both protein and calorie content of vegetable momo was found to be the lowest.

4.2.2. Study on feeding practices of children of age 6 to 24 months

Child malnutrition is a very serious problem in Nepal. The most affected group is 6 to 24 months of age. The major cause of the problem, among others is the unsatisfactory weaning practice. Breast milk is sufficient for the infants from birth to 6 months of age and exclusive breastfeeding is recommended for this age group. Similarly, after six months an appropriate weaning food is recommended along with breast milk. Breastfeeding should be continued up to 24 months of age.

A study was carried out in Kanti children's hospital to investigate the feeding practice of children of age from 6 to 24 months. A total of 100 questionnaires were filled out and subsequent data was analyzed and the result was found as given below.

Breast Feeding:

The result for breastfeeding showed that 88 % of the respondents were found to feed colostrums, 25 % were found to practice exclusive breastfeeding upto 6 months and 74 % were found to practice optimum breastfeeding (i.e. 4 or 5 times a day).

Introduction of others milk

Breast milk is the optimum food for infants; this milk is especially designed for the human baby. The other milks such as cow and buffalo milk contain a higher calcium and casein, which makes the infants difficult for digestion. The appropriate age to introduce other milks is 12 moths. The study found that 40% of the respondents introduced before 6 months, 34% introduced at 6 months and 26% introduced after 6 months.

Introduction of solid foods

After 6 months of age, child needs solid food. The study found that only 41 % introduced at the right age i.e. 6 months. Some (32 %) introduced it before 6 months, and others (27%) introduced after 6 months. The respondents who fed solid food to their children, maximum of them (81.5%) fed solid foods for 3 times a day.

Feeding of Super flour (Sarvottam Pitho)

Super flour (*Sarvottam Pitho*) is the appropriate weaning food for the children of 6 months and above. The study found that 71% of respondents were found to feed super flour (*Sarvottam Pitho*). For the preparation habit, 31 % were found to purchase from the market, 34 percent were found to prepare at home and the remaining 6 % were found to use both types of preparations. The respondents who prepared super flour at home, 35 % used the ratio of 1:1 for cereal and legume, where as 38 % of them used the ratio of 2:1, 12 % used the ratio of 3:1 and the remaining 15 % used approximate ratio.

4.3. Recipe development

The purpose of recipe development is to develop and promote low cost and high nutritional value foods. In this year, two recipes were developed and analyzed for their nutritional quality. These two include soup from stingy nettle (*Sisnu*) and the other is pumpkin and papaya mixed jam.

4.3.1. Preparation and quality evaluation of Nettle's Soup (Sisnu ko Soup)

Soup is a popular liquid food, especially for sick persons and children. People of all age groups like soups. There are many varieties of soup, viz. mushroom soup, corn soup, thick soup etc. in the market. As nettle (*sisnu*) is very rich in calcium and iron, its soup is presumed to fulfil calcium and iron deficiency to some extent.

Two types of nettle's soup were prepared. One was from nettles' (shoot) young leaves and flower (*sisnu ko muna ra ful ko*) soup and another was from Nettle's tip's only (*sisnu ko muna ko soup*).

Nettle's soups were prepared by using varying percentage of nettle powder and corn flour and by keeping other ingredients such as cumin powder, coriander powder, onion powder, garlic powder, monosodium glutamate and salt at a fixed level. Among them, five blends of Nettle (*sisnu*) were selected for recipe and those samples were tested for sensory evaluation.

40% young leaves' soup was found to be the best one among all samples. 60% young leaves' soup was also not significantly different with 40% young leaves' soup in terms of all parameters. Hence 60% young leaves soup was also considered as good as 40% young leaves soup. It can be concluded that for making nettle's soup, up to 40 to 60% incorporation of

nettle's powder gives best soup while considering like colour, flavour, taste and consistency.

4.3.2. Preparation and quality evaluation of Pumpkin and Papaya mixed jam

Jam is a popular food, which is consumed by spreading on bread. People from all age groups relish jam. There are many varieties of jam, viz. strawberry jam, blueberry jam, apple jam, mixed fruit jam, orange jam in the market. Papaya is very rich in vitamin A but is expensive in off season. Another vitamin A rich vegetable, pumpkin is cheaper than papaya and its colour is also similar to papaya. Pumpkin was incorporated to papaya jam to decrease its cost. Pumpkin and papaya mixed jam was prepared to improve its quality and assess its overall acceptability by organoleptic tests and quality. Pumpkin and Papaya mixed jam is presumed to fulfill vitamin A deficiency to some extent.

Pumpkin and papaya mixed jam were prepared by using varying percentage of papaya and pumpkin such as 100% papaya, 80% papaya, 60% papaya, 40% papaya, 20% papaya and 0% papaya by keeping other ingredients constant. Among them, five blends of pumpkin and papaya mixed jam were selected as best recipe and those samples were tested for sensory evaluation.

Statistical analysis of data from sensory evaluation showed that in terms of colour, 100% papaya jam got highest score. But there was no significant difference between 80%, 60% and 20% papaya jam which was mixed with pumpkin. Hence, it can be said that up to 60% papaya jam can be prepared for acceptable colour. But in terms of flavour, 20% papaya jam got highest score but there was no significant difference between all samples. In terms of spread- ability on bread, 60% papaya jam got score and there was also not any significant difference between all samples. In terms of taste also 60% papaya jam got highest score and there was also not any significant difference between all the samples. Hence in over all, it can be stated that 60% papaya jam which was mixed with pumpkin gave best result without imparting bad effect on quality of jam.

4.4. Food and Nutrition Education and Communication

4.4.1. Food and nutrition Radio Program:

A total no. of 24 radio programs were developed and broadcasted through agriculture radio program at 6.45 p.m every second and last Tuesday of the month. The topics covered were as follows:

- Nutritious Lito: The best food for children.
- Vitamin C and its importance.
- Nutritious Tiffin for school going children.
- Breast feeding and its importance.
- Methods of preparation of weaning food (Lito).
- Importance of milk for women and children.

- Balance diet and its Importance.
- Nutritional importance of Sisnu powder(Nettle powder)
- Importance of Iodized salt.
- Nutritional requirement of adolescent girls.
- Importance of traditional foods.
- Nutritious food for lactating women.
- Malnutrition: Problems and solution.
- Food borne disease and methods of prevention.
- Method to achieve of food safety.
- Causes of malnutrition.
- Impacts of readymade food on human nutrition.
- Vitamin A and its importance.
- Eat fresh food and be healthy.
- Use of appropriate preservation and processing techniques to prevent malnutrition.
- Role of women for the nutritional improvement
- Importance of safe water for human nutrition
- Harmful effects of adulterated foods and measures to prevent them
- Care in child nutrition
- Appropriate crop planning: year round nutrition

4.4.2. Food and Nutrition message through radio:

Two radio jingles one based on weaning food (Sarvottam Pitho) and the other one based on food based dietary guidelines were prepared and broadcasted 25 times each through Radio Nepal. The topics of the jingles were: *Sarvottam Pitho Poshilo Lito and Ashal Khanpan.*

4.4.3. Poster, leaflets publication

- Two posters based on food based dietary guidelines named *Nepalika Lagi Ashal Khanpan(1000pcs)* and *Kareshabari Poshan ko Bandar(1000pcs)* were published.
- Two leaflets - Nutrition and HIV Aids (1000pcs) and updated food composition table (1000pcs) were published.

4.5. Community Food and Nutrition

This program was designed to advocate the importance of food and nutrition. The program includes the survey of the community (poor and marginalized) on food consumption and nutritional status, presentation of the survey result to the community as well as among the development agencies (both government and non-government) and conduct training and meetings to discuss the various aspects of food and nutrition. In this year two communities were selected, one Dhimal community of Urlabari, Morang and other the tea laborers of Ilam.

4.5.1. Food Consumption and Nutritional Status Study Report

Food consumption and nutritional status survey was conducted in Urlabari, Morang and different tea gardens of Ilam district. The summary of survey report is presented in the table below :

Table-11 : Food Consumption and Nutritional Status:

S.N.	Food and Nutrition Indicator	Dhimal (Urlabari)	Tea Laborer (Ilam)
1	Average Calorie Consumption (Kcal/cap/day)	2482.9	2100
2	Average Protein Consumption (g/cap/day)	71.5	75.5
3	Calorie consumption less than 2124 Kcal (%)	30.7	58
4	Protein Consumption less than 60 g (%)	43.3	71
5	Stunting (under five)	15.4	51.6
6	Wasting (under five)	11.8	15.2
7	Under weight (under five)	13.6	26.3
8	Stunting (school age)	19.2	70.2
9	Under weight (school age)	3.8	47.6
10	Adult under nourished based on BMI	10.4	1.4
11	Adult over nourished based on BMI	16.9	39.2

Based on the above table, almost all indicators of food consumption and nutrition of tea laborers were found to be worse than the Dhimal community. The indicators of nutritional status, if compared with Nepal Demographic and Health Survey 2006, all indicators of Dhimal community and weight for age of tea laborer were found to be better than the national average of these respective indicators. The indicators of stunting and wasting of tea laborers are worse than the national average for those respective indicators.

a. Food Consumption and Nutritional Status of Dhimal

i. Nutritional status

- **Under five children:** Among under five children, 13.6 % of were found to be underweight with 8.2% severe cases. Similarly, 15.4 % of them were found to be stunted with 5.4 % severe cases and 11.8% wasted with 6.4% severe cases.
- **School age children:** Among school age children, 3.8 % were found to be underweight with 5.8 % severe cases, Boys (19.22 %) were highly stunted than girls (9.25%). On the basis of weight for age 15.37% girls and 15.38% boys were found to be undernourished.
- **Adults:** Among adults, 10.4% were found to be under nourished and 16.9% were over weight.

ii. Food consumption

The community was found to consume an average calorie of 2482.93Kcal/ person/ day and an average protein of 71.5 g/ person/ day. For sufficiency of consumption, 30.69% were found to consume less than 2124kcal (the cut off point for poverty threshold) and 43.26% were found to consume protein less than 60gm/ person/day.

iii. Socio-Economic Status

Majority (35%) of the households were found to be engaged in agriculture followed by foreign employment (28%). Majority of them were found to own either less than one *ropani* or 1 to 5 *ropani* with 16.5 % without land. For nutrition supply , 49 % of the households were found to have backyard garden, 6.7 % were found to have milk animals and 53 % were found to have egg laying chicken.

iv. Food consumption pattern:

Majority (71%) of the households were found to eat three times daily followed by 2 times daily (23%). Nearly 50 % of the households were found to eat legumes pulses daily. About 50 % of the households reported that they eat fruits once a week. Forty seven percent of the households were found to use iodized salt.

v. Sanitation and Hygienic condition

Regarding hygiene and sanitation, 23.52% of the households were found to have water supply system, 79.21% were found to store water on water pot, where 46% were found to cover their water container. For washing hands, 44 % were found to use soap but 62% of the households were found to have soap. For toilet use, 21.56% were found to have permanent sanitary toilet.

vi. Mothers and children under two years:

About 15 % of the mothers responded that their child was low birth weight i.e below 2.5 kg. For the age at birth, 54% of the mothers were found to give birth at the age below 20 years.

Only 11% of the mothers were found to have secondary or higher secondary education, where as 25% were illiterate.

During pregnancy, 39.2% of the mothers were found to eat meat and fish and during lactation 64 % of them were found to eat these foods.

vii. Breast feeding practices:

Regarding breastfeeding, 61.8 % mothers were found to breastfeed their children within one hour of birth where as 74.5.% of the mothers were found to feed colostrums. Breastfeeding was found to be highly practiced with 92% mothers breastfeeding four times or more a day. Early cessation of breastfeeding was found with 30% mothers, who breastfed their child only up to six months. The early introduction of other milks was observed with 20.54% mothers feeding other milks before six months. Early introduction of solid food was observed, where 36% introduced it before the child becomes six months of age

b. Food Consumption and Nutritional Status of tea laborer, Ilam

On the basis of predetermined questionnaires, 24 dietary hour recall and Anthropometry measurement the summery of the finding is given as follows.

i. Nutritional Status

- **Under five children :** Among under five children, 26.3% of were found to be underweight among which 14% were severely underweight and 7% were found to be overweight. Boys (31%) were found to be more underweight than girls (22%). Similarly 51.6% children were found to be stunted with 34 %severe cases and 15.2 % children were found to be wasted with 8.7 % severe cases.
- **School age children:** Among school age children, 47.6% were found to be underweight. The situation of girls was more serious with 75% stunting (low height for age) than the boys with 64.7 % stunting. On the basis of weight for age 3.85% girls and 18.5% boys were malnourished.
- **Adults:** Among adults 1.38% were found to be under nourished and 39.28 % were found to be over weight.

ii. Food Consumption

The population was found to consume an average calorie of 2100.3 Kcal/ person/ day and an average protein of 75.53 gm/person/ day. Fifty eight percent of the households were found to consume less than 2124 Kcal/person/day (the cut-off point of poverty threshold), where as 71% were found to consume protein less than 60gm/day. Forty five percent of the households were found to use iodized salt.

iii. Socio-Economic Status :

Work in the tea garden is the main source of income of those households. Most of the family members (72%) work there. The study found that 22 % women were found to attain certain schooling, 28% were literate and 24% were illiterate. For the family size, 43% had the family size of 6. The land ownership situation showed that 22 % had no land. Those who have land, most of them (88%) get food from their own production only for six months. For their nutritional supply, 71 % were found to have backyard garden, 59 % were found to have milk animals, and where as 58 % have egg laying chicken.

iv. Feeding practices of children

Regarding breastfeeding, 50 % mothers breastfed their child within one hour of birth, 77.5 % mothers fed colostrums, 31% mothers breastfed their children three times or more a day. Only 18% of the mothers breastfed their children up to six months, whereas 48% breastfed up to two years. Other milks such as cow's and buffalo's milk should not be introduced before the age of 12 months. The study found that 56.5 % the mothers were found to introduce other milks before six months. Similarly, solid food should be introduced only after six months. But the study found that 35% of the mothers started feeding solid food before six months. Still the majority of the mothers (65%) were found to start feeding solid foods only after six months.

v. Snack Foods and School Tiffin

Regarding, school Tiffin, 51 % mothers responded that they sent school Tiffin for their children and 46 % said not send. Among them 44% sent homemade Tiffin and 10 % sent readymade and 7 % sent both types.

4.5.2. Food and Nutrition Training

a. Weaning food promotion Training:

One day training was given to 20 Dhimial mothers of children of 6 to 24 months in Uurlabari VDC of Morang district and 20 mothers of children working in different tea garden and factory of Ilam district. In the training theoretical and practical classes about importance and methods of preparation of Bal Ahar, nutritious diet for children and importance of health and sanitation for children's diet were covered.

b. Food and nutrition training for frontline development workers:

Three days' nutrition training for frontline development worker was organized in Uurlabari VDC. A total number of 20 development workers from District Agriculture Development Office, District Livestock

Services Office, District Women Development Office, primary school and other governmental organization participated in the training program. In the training, the following topics were covered.

- Food and Nutrition.
- Deficiencies due to imbalance of nutrients.
- Under nutrition: Protein Energy Malnutrition.
- Deficiencies of malnutrition: problem and solution
- Causes of malnutrition.
- Method of assessment of malnutrition.
- Present situation of malnutrition in Nepal.
- Importance of health program for improvement of nutrition.
- Importance of food safety and quality for improvement of nutritional situation
- Over nutrition : an emerging problems
- Group discussion and presentation on nutrition intervention program

c. Food and Nutrition Training for Women

Three day nutrition training was organized in the Uurlabari VDC of Morang district and in Ilam district. In the former training, altogether 20 women (one Female Community Health Volunteer and one woman from each ward no. and two women from non governmental organizations) participated and in the later training 16 women from different tea garden and factory of Ilam district participated. In both of the trainings the following topics were covered.

- Importance of diet
- Malnutrition.
- Causes of Malnutrition.
- Impact of malnutrition.
- Growth monitoring chart.
- Nutritious diet for children. Importance of weaning food.
- Method of preparation of weaning food.
- Importance of health and sanitation in children diet.
- Method of prevention from malnutrition.

4.5.3. Food and Nutrition meeting

One day meeting was organized in urlabari VDC of Morang district, where 40 persons from different government and non-govt. organization, journalists and members of political parties, secretary and members of Dhimal caste Development Organization participated and discussed on the present food and nutrition situation, problems and solution of Dhimal caste of Uurlabari VDC. In Ilam, one mass meeting was organized, where altogether 32 leader and senior staff of different tea garden and factory participated and discussed on the food and nutrition situation, problems and solutions.

4.5.4. Food and Nutrition Seminar

One day seminar was organized in Biratnagar and Ilam. Altogether 38 persons participated in the program in Biratnagar, where as 35 participated in Ilam. Chief District Officers were the chief guests in both of the programs. The other participants were the representatives from various government and non government organizations, journalists and others.

4.6. HIV/AIDS and Nutrition Training:

A six days' training on HIV/AIDS and Nutrition was organized in the Department of Food Technology and Quality Control. In the training 15 representatives from different government and non government organization related to HIV/AIDS participated. The participated organizations are: Kathmandu Plus, Shahara Plus, Maiti Nepal, Equal Access, Oxygen Research and Development Forum, Nepal Family Planning Association, National Center for HIV/AIDS Control, Sneha Samaj.

In the training following topics were covered:

- Basics of HIV/AIDS
- Food and nutrition
- Classification of foods on the basis of their nutrient contents
- Nutrients and their function.
- Balance diet and its importance
- Daily requirements of nutrients
- Interrelationship between HIV/AIDS and nutrition
- Nutritional requirement for HIV/AIDS
- Management of diet for HIV/AIDS
- Importance of food safety management
- Nutritional management for HIV/AIDS women
- Prevention of HIV/AIDS from mother to child.
- Nutrition for HIV/AIDS children
- Interrelationship between medicine and nutrition for HIV/AIDS
- Field visit in Nav Kiran Plus, Hattigauda

4.7. Development of Food Based Dietary Guidelines:

One day seminar was organized on food based dietary guidelines. In the seminar 25 senior officers from various government and non government organizations participated.

The seminar finalized the Five Storey of Good Nutrition and Ten Mantras of Good Nutrition. The guideline is as given below.

Five Storey of Good Nutrition

- i. Eat cereals, their products, roots and tubers adequately
- ii. Eat legumes and pulses in every meal
- iii. Eat fruits and vegetables (especially green leafy vegetables and yellow fruits and vegetables) everyday
- iv. Eat livestock products (meat, fish, eggs and milk) regularly

- v. Eat sweets, fats and oils as per need

Ten Mantras of Good Nutrition

- i. Eat a variety of foods everyday
- ii. Eat at least four times daily
- iii. Promote nutritionally important traditional foods
- iv. Always use iodized salt
- v. Exclusively breast feed your baby up to six months and feed nutritious solid foods after six months
- vi. Pregnant and lactating mothers eat extra and nutritious foods daily
- vii. Always eat safe and clean food
- viii. Drink enough safe and clean water
- ix. Avoid alcoholic beverages
- x. Always be physically active

5. WTO/SPS Agreement and Obligations

After the entry of Nepal to WTO, guided by SPS agreement, Nepal needs to fulfill certain obligations. Among those obligations along with other government agencies, Department of Food Technology and Quality Control has a certain role to play. The progress status in the direction of fulfilling those obligations is given in the table 12 and 13 below.

Table - 12: Preparation to meet the obligations under WTO

(As of Ashad, 2064) August, 2007

Action	Implementation Date	Responsible Organization	Present Status
1. Establishment and operation of a single Contact Point for Information ("enquiry point") (Article 7 and Annex B:2)	1 January 2004	Department of Food Technology and Quality Control (DFTQC)	DFTQC has been designated as the National SPS enquiry point.
2. Acquisition of equipment and training of SPS enquiry point personnel (Article 7 and Annex B:2)	1 January 2005	DFTQC	<ul style="list-style-type: none"> • Five set of computer acquired. • E-mail account opened (spsnepal@ntc.net.np) • Internet connected. • Website prepared and hosted. (http://www.spsenquiry.gov.np) • One of the staffs from SPS enquiry point was subjected to a 3 days training program on SPS, organized by WTO. • Request for training and other equipments has been forwarded to higher authorities. • Training of 5 technical persons completed at Mahidol University, Thailand.
3. Approval or Amendments to: Plant Protection Act 1972	Prior to 1 July 2005	Plant protection Directorate/ Legal Section MoAC	<p>Plant Protection Act 2064 (2007) has been enforced by the Legislative - Parliament on August, 2007.</p> <p>Review and amendment of existing "Slaughter house and meat inspection Act, 2055 ;Veterinary Council Act, 2055; Animal Health and Livestock Services Act, 2055 are proposed in regular program in the Directorate of Animal Health (AHD), Central Animal Quarantine Office.</p> <p>Draft of the Proposed New Veterinary Drug Act presented to Department of Livestock Services (DoLS)</p>
4. Approval or Amendments to: Seed	Prior to 1 July	National Seed	<ul style="list-style-type: none"> • The draft for amendment was

Act 1988	2005	Board/ Legal Section, MOAC	approved from Cabinet and the steps for process of enactment is going on.
5. Designation of authority responsible for making notifications to the WTO and ensuring transparency obligations are met on an ongoing basis.	Prior to 1 July 2005	WTO Section of ABPSD, MOAC	<ul style="list-style-type: none"> WTO Section of ABPSD is designated as the National Notification Authority of SPS. Web site prepared and hosted (http://www.moacwto.gov.np) Email: <wtosection@gmail.com>
6. Review of all existing regulations and new amendments to ensure regulations are based on risk assessments and sufficient scientific evidence.	Prior to 1 July 2005	MoAC / Legal Section MoAC	<ul style="list-style-type: none"> Draft Food Act for amendment has been prepared in the assistance of FAO. Translation of draft into Nepali has been completed The translated draft has to be subjected for discussion with stakeholders, then it has to be presented to legislative procedure for enactment.
7. Upgrading of human resources with special emphasis on quarantine management, meat inspection, veterinary investigation and animal disease risk analysis.	Prior to 1 July 2005	Administration Division MoAC in coordination with Departments DFTQC, DoA, DLS.	<ul style="list-style-type: none"> Food Quarantine Lab established at four customs points (Tatopani, Kakadbhitta, Birgunj, Mahendranagar) and most of the staffs are appointed (11 posts fulfilled out of 13). Request for HRD is forwarded to concerned higher authorities. Mainpower has been trained in Animal Quarantine and Veterinary services: Quarantine management officer- 67, Veterinary Investigation Officer (middle level)- 32, Meat Inspector (Officer level) - 56.
8. Declaration of pest or disease-free areas and areas of low pest or disease prevalence (Article 6 and Annex A: 6 and A: 7)	Prior to 1 July 2005	Plant Protection Directorate, Animal Health Directorate, NARC	The PFA program has been initiated from FY 2062/63. Rinder pest (RP) and Foot Rot disease officially declared as eradicated Bluetongue, HPAI and BSE: Clinically disease free and surveillance activities are on-going Major animal diseases: PPR and Hog cholera
9. Approval or Amendments to: Plant Protection Regulations 1975	Prior to 1 January 2006	Plant Protection Directorate/ Legal Section MoAC	Plant Protection Regulations Drafting will be prepared within FY 2063/64 after enactment of the Plant Protection Act .
10. Membership in the International Plant Protection Convention (IPPC)	Prior to 1 January 2006	Administration Division MoAC	Nepal has got membership of the IPPC formally since 8 May, 2006 .

11. Implementation of Publication and Notification procedures including a process to take comments into account without discrimination (Annex B: 1, 3, 5 and 10)	Prior to 1 January 2006	WTO Section / ABPSD	Training has been proposed under UNDP Project in the Ministry of Industry, Commerce and Supplies
12. Initial notification of legislation and regulations to WTO	Prior to 1 January 2006	WTO Section / ABPSD	Thirty five legal texts of Nepalese language have been translated into English for notification purposes. Preparation of website that was proposed in the program of 2062/63 has been completed.
13. Development of SPS guidelines and protocols	Prior to 1 July 2006	DFTQC	<ul style="list-style-type: none"> • Working guidelines for Quarantine Food Lab has been prepared and circulated. Necessary amendments are in process. • Draft of Export Import Inspection and Certification System is in finalizing stage. • Program is underway to prepare guideline and protocols. • Food Research Consultancy Services, Bhaktapur has submitted 3 guidelines to the Department which has to be finalized for implementation. • Work on the preparation of other SPS and food safety related document is going on.
14. Upgrading and strengthening of quality control unit, laboratory, quarantine system and field veterinary system	Prior to 1 January 2007	DFTQC/ DOA / DLS	<ul style="list-style-type: none"> • Budgetary resources for upgrading and strengthening of quality control unit, laboratory, has been allocated recently. • The construction of new SPS/ Codex, Laboratory building is going on. • Procurement of laboratory equipments is in process. • Veterinary Standards and Drugs Administration (VSDA) office set up. • Drafts of standards on Biologicals, Lab, Hatchery and Poultry Breeding farm prepared and submitted to DLS for approval. • SOP drafts of VSDA prepared. • Provisions of procurement of heavy equipments and training packages in CLDP. • Lab Services : Accreditation of PPR and Rinderpest

			<p>diagnostic techniques from IOE. Upgrading diagnostic facilities in central, 5 in region and 1 for avian lab in Chitwan. Drafts of SOP of central veterinary investigation lab and Rabies lab are prepared.</p> <ul style="list-style-type: none"> Field Veterinary Services: Vet- inspectors are deputed in all districts. Evaluation of the program on-going with budget allocation in regular program.
15. Opening new quarantine check post and development of pre and post quarantine facilities	Prior to 1 January 2007	Plant Quarantine Section / DoA / Animal Quarantine Section / DLS, MoAC	<p>Eight new plant quarantine check-posts have been established (5 are in Nepal-India border and 3 are in Nepal-China border) and are functioning well.</p> <p>In animal quarantine office: power conferred by law but required manpower not fulfilled.</p>
16. Harmonization with international standards, guidelines, and recommendations (Article 3)	Prior to 1 January 2007	DFTQC	<p>National Codex Committee has been established.</p> <p>Process for the Harmonization of standard on different food products with CODEX is going on.</p>
17. Control, inspection and approval procedures for all SPS measures	Prior to 1 January 2007	National SPS Enquiry Point	The procedure and measures developed within this year will be ready to be implemented before January 2008.
18. Review the import of the PIC listed pesticides Methyl Parathion and Monocrotophos	asap	Plant Protection Directorate	Review work revealed that Toxic residue level of Methyl Parathion and Monocrotophos in tomato is over than tolerance level.
19. Streamline and scientifically build land border quarantine procedures (in line of APPPC)		Plant Quarantine Section/ Animal Quarantine Section	<p>Preparation for the Plant Quarantine Procedures (Export Import Operational Manual) has been prepared.</p> <p>Draft guidelines for land border animal quarantine procedures are under discussions in DOLS.</p>
20. Full implementation of the WTO Agreement on Sanitary and Phytosanitary Measures	Prior to 1 January 2007	HMG/ Nepal	
Trade - Related Intellectual Property Rights (TRIPS)			
21. Approval of Plant Variety Protection Act	No later than 1 January 2006	Seed Quality Control Center, National Seed Board, NARC, Legal Section/ MoAC	<p>Draft of the Act has been sent to the Cabinet for prior Approval .</p> <p>The implementation date for the least developed countries for protection of trade marks, copyrights, patents and other IP under the WTO agreements has</p>

			been extended to 1st July, 2013 by the decision reached by member governments on 29 November, 2005 just prior to 6th Ministerial Meeting in Hongkong.
22. Inclusion of law on the protection of Geographical Indication		DOA/ DLS/ Legal Section of MoAC	Included in the Draft of Industrial Property Protection Bill.

Table-13 : Voluntary provisions and deadlines

Actions	Implementation Date	Responsible Organization	Present Status
1. Develop alternative for agriculture development fee (ODC)	2005	MoAC	
2. Ratification of international treaty on plant genetic resources for food and agriculture.		Planning division/ MoAC	
3. Strengthening the annual program to increase international competitiveness.		All Departments planning division/ MoAC	The annual programs have been tied up with competitiveness creation.
4. Guiding local governments for modification of the developed agricultural program.		All Departments planning division/ MoAC	
5. Development of appropriate technology		NARC, NARDF	
6. Revision of curriculum of IAAS, HICAST and other Related Institutions to match the context of WTO.		Coordination by planning Division/ MoAC	
7. Develop policy, laboratory and human resource for regulating the genetically modified organisms and their products.		Seed quality control center, DLS	
8. Develop quarantine procedure in the line of OIE.		Animal quarantine / DLS	Animal quarantine procedures has been prepared in the line of OIE and it is in the process of getting approval (As no. 19 of the action plan above)

6. SPS National Enquiry Point

The enquiry point is the single government body responsible to provide "answers to all reasonable questions" from interested countries, as well as for the provision of relevant documents, regarding:

- Any sanitary or phytosanitary regulations adopted or proposed within the country;
- Any control and inspection procedures, production and quarantine treatment, pesticide tolerance and food additive approval procedures, which are operated within the country;
- Risk assessment procedures, factors taken into consideration, as well as the determination of the appropriate level of sanitary or phytosanitary protection;
- Membership and participation of the country, or of relevant bodies within its territory, in international and regional sanitary and phytosanitary organizations and systems;
- Membership and participation of the country in bilateral and multilateral agreements and arrangements within the scope of the SPS Agreement; and,
- Texts of any such agreements and arrangements.

Other government agencies than the enquiry point in the country will continue to receive direct requests on matters such as those outlined above and they should be free to continue answering them. Enquiries that come to the individual units within government agencies (i.e. not through the enquiry point) can be answered directly and do not need to be processed through the enquiry point system. However, the enquiry point is listed by the WTO as having this responsibility, and must respond to any requests made of it.

Requests to the enquiry point may come from other countries' enquiry points or originate from other interested parties (such as industry groups) in countries, and from non-member countries. Although the legal obligation is only to respond to requests from other WTO Members, the enquiry point is encouraged to treat all such enquiries equally, and respond to all reasonable requests for information about the country's SPS measures. It is best to reply directly to whoever makes the request, but to support the enquiry point system, it is recommended to send a copy of replies (and a list of material supplied) to the relevant country's enquiry point.

6.1. Query

There was one query from Australian SPS Contact Point regarding text (in English) of notification from Nepal i.e. G/SPS/N/NPL/3 dated 30 November 2006. In response to that unofficial translation of the text was provided to concerned authority.

6.2. Publication

In this fiscal year, a leaflet on " SPS National Enquiry Point - An Introduction" (700 copies) was published.

6.3. Documentation

In this year, two documents were reprinted and documented. A total number of 25 copies of the "Prevention of Food Adulteration Act and Rules, 2006" and 40 copies Directives on Export-Import Inspection and Quality Certification System in Nepal were reprinted and distributed to the different offices and sections of DFTQC.

The following hard and soft copies of the documents are available at SPS National Enquiry Point.

Hard Copies:

- ☞ Gazette: Protocol on the accession of Nepal into WTO
- ☞ International Standards on Phytosanitary Measures (ISPM)
- ☞ Agreement on Agriculture
- ☞ Agreement on the Application of Sanitary and Phytosanitary Measures
- ☞ Food Act, Regulation and Standards
- ☞ Feed Act & Regulation
- ☞ Pesticide Act/ Regulation
- ☞ The Seeds Act/ Regulation
- ☞ Guideline For Pest Risk Analysis
- ☞ Principles of Plant Quarantine as Related to International Trade
- ☞ Pesticide Residues in Food FAO/WHO, 1993
- ☞ Pesticide Residue in Food MRL Codex – 1998, 2000
- ☞ Understanding Codex
- ☞ Codex Procedural Manual
- ☞ Compilation of Codex Standards (40 food items)
- ☞ Codex Food Hygiene Basic Texts (2003)
- ☞ Fish and Fishery Products- 2001- General Requirements- 1999
- ☞ Compendium Food Additive Addendum – 7, 11
- ☞ Veterinary Drug Residue in Animals and Food FAO/WHO 1999, 2003
- ☞ CAC Report 26th (2003), 27th (2004) Session
- ☞ CAC Milk and Milk Products, 2000
- ☞ CAC Fat, Oil and Related Products, 2001
- ☞ JECFA Specification for Identity and Purity of Certain Food Additives
- ☞ ISPM 1-29 (2007)
- ☞ Interim Commission on Phytosanitary Measures Report 2004, 2005
- ☞ SPS Measures and Environmental Management in Bangladesh

Soft copies:

- ☞ Updated SPS notifications
- ☞ A Guide to WTO- SPS Agreement – A Training CD-ROM
- ☞ Legal Texts of WTO
- ☞ How to Apply The Transparency Provisions of The SPS Agreement, Handbook
- ☞ Issue Paper from Pakistan regarding SPS &TBT agreements
- ☞ The Prevention of Food Adulteration Act and Rules (2004)
- ☞ Agreement on the Application of Sanitary and Phytosanitary Measures
- ☞ The Challenge of Conforming to SPS Measures for China's Agricultural Exports
- ☞ International Harmonization of SPS Standards- submitted by India
- ☞ Food Sanitation Law in Japan
- ☞ Food Additives in Japanese Food Laws
- ☞ Food Safety Basic Law (Japanese)
- ☞ Plant Quarantine Acts of Pakistan
- ☞ Terrestrial Animal Health Code (2004)
- ☞ Codex Standards (2005/2006) CD-ROM
- ☞ GAIN Reports
- ☞ ISPM 1-29 (2007)
- ☞ Dispute Settlement Manual, IPPC , 2006
- ☞ Plant Protection Act
- ☞ Plant Protection Regulation
- ☞ Food Act
- ☞ Food Regulation
- ☞ Food Standards (Nepali)
- ☞ Feed Act
- ☞ Feed Regulation
- ☞ Drugs Act
- ☞ Drugs registration regulation
- ☞ Essential commodities act
- ☞ Infant Milk substitute act
- ☞ Mother's Milk Regulation
- ☞ Pesticides Act
- ☞ Pesticides Regulation
- ☞ Animal health and livestock services act
- ☞ Animal health and livestock Services Regulation
- ☞ Nepal Veterinary Council Act
- ☞ Nepal Veterinary Council Rules
- ☞ Slaughterhouse and Meat Inspection Regulation
- ☞ Quarantine Amendment Regulation, Australia, 2007
- ☞ Import Risk Analysis, Handbook, Australia, 2007

7. Special Projects

7.1. Agriculture Perspective Plan Monitoring and Coordination Project

This program includes activities aimed at strengthening the department. Under this program, following activities were conducted:

7.1.1. Construction of Buildings

In this fiscal year, about 65% of the construction work of SPS / Codex Building at the premises of the Department of Food Technology and Quality Control was accomplished. Similarly, about 90% construction of laboratory building of Regional Food Technology and Quality Control Office, Dhangadhi, was accomplished and maintenance of laboratory building of Regional Food Technology and Quality Control Office, Hetauda was accomplished.

7.1.2. Machinery/ Equipments

For the purpose of Instrumentation laboratory of Central Food Laboratory, Air Conditioner- 1 set was procured. Also, one set of UPS was also procured for power back up to computer.

7.1.3. Furniture/ Fixture

The furniture/fixtures were proposed for documentation unit and instrument laboratory of Central Food Laboratory. All together 50 items were purchased including steel rack, book case, office rack, office table, revolving chair etc.

7.1.4. Preparation of Guidelines

In this fiscal year, drafts of four guidelines were prepared:

- i. **Standard Operating Procedure for Food Inspection:** This document is aimed to facilitate the food inspection activities and covers inspection of food market, industries etc.
- ii. **Hygienic Practice in Small Scale Milk Production and Dairy Industry:** The aim of this guideline was to facilitate hygiene maintenance in small scale dairy.
- iii. **Guideline on Hygiene Practices for Traditional Food Production:** The aim of this guideline was to facilitate hygiene maintenance in traditional food production.
- iv. **Meat Processing Guideline for Trade and Industries:** This document is aimed to facilitate hygiene maintenance for meat processors.

7.1.5. Visit Program:

This program was aimed at acquiring information on SPS related activities of India. Under this program, two persons from SPS National Enquiry Point, one person from quality control division and one person from planning section (all together 4 personnel) visited different SPS related authorities of India for 7 days. The program was very fruitful in terms of acquiring knowledge.

7.2. Strengthening of Food Quality Management Project

This project is a Non-Project Grant (NPG) support from the Government of Japan. The main objective of this project is to construct a laboratory building at the premises of the Department of Food Technology and Quality Control as well as to procure sophisticated laboratory equipments such as Gas Chromatography, High Performance Liquid Chromatography, Atomic Absorption Spectrophotometer etc.

In this year, 65% of the construction work of Central Food Laboratory was completed. By the end of this fiscal year, 39 different machineries and equipments were procured.

8. Other Projects

The department carried out some other activities by the support of WHO and Micronutrient Initiative Nepal.

8.1. Strengthening Food Laboratories for Micronutrient Monitoring Project

The project Strengthening Food Laboratories for Micronutrient Monitoring was initially signed between MI and DFTQC in The department carried out some other activities by the support of WHO and Micronutrient Initiative Nepal. The following accomplishment was made.

i. Revision in the Standard of Wheat Flour

One Consultative Meeting was held and the meeting agreed on voluntary fortification for one year. After the successful voluntary fortification for one year, DFTQC, by the consultation with stakeholders, will proceed further on mandatory fortification. In this regard standard was approved by the Food Standardization Committee for the fortification of wheat flour with Iron, Folic Acid and Vitamin A. Now it's in the process of publication in Nepal Gazette.

ii. Procurement of Equipment and Glassware for Regional Food Laboratories

Five sets of spectrophotometers, two electronic balances and other glassware were procured and distributed to the regional laboratories.

iii. Preparation of Quality Assurance Manual

A Quality Assurance Manual for the analysis of micronutrients was prepared.

iv. Quality Assurance Training

Quality Assurance Training was conducted on 13-18 August 2006 with 10 participants from five Regional Food Technology and Quality Control Offices.

v. Study on Nutritional Labeling Practices

A total number of 600 packaged food samples were collected and labeling practice was studied. Out of these samples, 120 samples were also analyzed in the Nutrition Laboratory in the Department of Food Technology and Quality Control, Babar Mahal and compared with that of label value.

vi. HPLC Procurement and Trouble Shooting Training

A set of HPLC was received from MI as a gift. Nayan Tara Tuladhar, Food Research Officer of DFTQC participated in the Trouble Shooting Training held in Singapore in April, 2006..

vii. Computerization and Networking of Food Data System

Food Data Networking Software was developed by Nepasoft Solutions Pvt. Ltd. , Kathmandu and the computers and accessories given in the table- were procured:

Table-12 : List of computers and accessories procured

S.N.	Item	Qty
1	Desktop Computer, (Belta)	13
2	Laptop (Acer)	1
3	Server (IBM)	1
4	Multimedia Projector (Optoma)	1
5	UPS 1.2KVA SM Tech	1
6	UPS 750 VA SM Tech	12
7	4 in 1 Printer Samsung SCX	1
8	HP Laser Jet Printer 1020	5
9	Computer Table T120	5

This activity would enable our system to make the analytical data and associated information up to date. It will help track the efficiency of the total system. The national food data networking will link 5 regional offices, 4 food laboratories and the customs points.

The Food Data Networking System in the department would enable the systematic entry of analytical data. It also would help the department in tracking back the food samples. After the implementation of this software, the monthly, quarterly, yearly reports can easily be prepared. It gives an easy access to the database and helps prioritize the actions and plan for the future activities of the department.

viii. Study on micronutrient content in various foods:

A total number of 150 samples of various Nepalese food items were analyzed for iron content quantitatively. Mr. Kamal Prasad Regmi, Food Research Officer was sent to CFTRI, Mysore, India_ for the training on Practice of HPLC in the present scenario on 2-6 July, 2007. Similarly some glassware and chemicals were also procured.

8.2. WHO Supported Activities

With the support from WHO Nepal two major activities were implemented.

i. Monitoring of Agro-chemical Residues in Tea and Honey

Field study was conducted in the tea and honey producing areas. Samples were collected and some representative samples (six samples of tea and 4 samples of honey) were sent to Central Food Technological Research Institute, CFTRI, Mysore (A NABL Accredited Laboratory), India. The report showed that these samples of honey and tea didn't contain any residues (up to the limit detectable by the laboratory).

ii. Publication of IEC materials

The following IEC materials Audio, audio-visual and print materials were developed and printed. Altogether two types of posters, two types of booklets, six types of audio materials and one type of audio-visual material were developed.

9. Revenue Collection

The total revenue collection is given in the table below. As shown in the table, Food Quarantine Laboratory, Birgunj has collected the highest revenue followed by Regional Food Technology and Quality Control Officer, Biratnagar.

Table 13 : Revenue Collection from different offices

S.N.	Office	Revenue, Rs.
1	DFTQC	718,795.00
2	RFTQC, Biratnagar	1,261,550.00
3	RFTQC, Hetauda	832,050.00
4	RFTQC, Bhairahawa	488,250.00
5	RFTQC, Nepalgunj	128,500.00
6	RFTQC, Dhangadhi	96,050.00
7	FQL, Kankadvitta	79,200.00
8	FQL, Birgunj	1,653,000.00
9	FQL, Tatopani	63,850.00
10	FQL, Mahendranagar	54,350.00
	Total	5,375,595.00

10. Annexes

Annex-1 :

Table-1 : Group-wise Sample Collection in Kathmandu Valley

S.N.	Food Group	Sample Collected	Substandard Sample	
			Number Sample	Percentage
1	Milk & Milk Products	41	28	68.3
2	Fats & Oil	132	43	32.6
3	Fruits & Vegetable Products	117	23	19.7
4	Spices & Condiments	148	16	10.8
5	Tea, Coffee, Cocoa & their Products	43	0	0.0
6	Salt	8	0	0.0
7	Cereal, Pulses & their products	315	21	6.7
8	Processed Drinking Water & Soft Drink	65	29	44.6
9	Sweetening Agent	23	5	21.7
10	Sweet & Confectionary	36	2	5.6
11	Others Food Products	106	2	1.9
12	Feed	27	15	55.6
	Total	1061	184	17.3

Table-2 : Commodity-wise Sample Collection and Adulteration, Kathmandu Valley

S.N.	Food Commodity	Total Sample	Adulterated Sample		Contaminated Sample	
			Number	Parameters	Number	Parameters
1	Processed Milk	18	13	Low fat, Low SNF, Coliform presence	1	Coliform presence
2	Milk Products	1	0	-	-	-
3	Ghee	22	15	Low RMV, High RI, High AV	3	High AV
4	Mustard Oil	58	17	AOT positive, High AV	17	AOT positive, High AV
5	Soybean Oil	36	6	High PV, Low Sap. value	5	High PV
6	Sunflower oil	23	9	High PV	9	High PV
7	Vegetable ghee	14	11	High MP, SOT negative	-	-
8	Other Edible Veg. Oil	1	0	-	-	-
9	Fruit Juice	56	0	-	-	-
10	Tomato ketchup	16	2	Low TSS	-	-
11	Orange Squash	17	10	Low TSS	-	-
12	Lemon Squash	7	5	Low TSS	-	-
13	Jam & marmalade	7	0	-	-	-
14	Pickle	7	4	Low acetic acid, High benzoic acid	2	High benzoic acid
15	Lapsy Products	4	1	Foreign Plastic matter as complements	1	Foreign Plastic matter as complements

S.N.	Food Commodity	Total Sample	Adulterated Sample		Contaminated Sample	
			Number	Parameters	Number	Parameters
16	Chilly Sauce	1	0	-	-	-
17	Pineapple Squash	1	0	-	-	-
18	Junar Squash	1	1	Low TSS	-	-
19	Chilly Powder	51	5	Low volatile & non-volatile oil, Foreign colour	2	Foreign colour presence
20	Turmeric Powder	32	0	-	-	-
21	Cumin Powder	28	4	Low volatile oil, High T. Ash	-	-
22	Coriander Powder	21	1	Low volatile oil	-	-
23	Spice powder	10	5	Low volatile & non-volatile oil	-	-
24	Cumin	3	0	-	-	-
25	Other Spices	1	0	-	-	-
26	Ginger Powder	1	1	High AIA	-	-
27	Cinnamom	1	0	-	-	-
28	Tea	43	0	-	-	-
29	Iodised salt	8	0	-	-	-
30	Rice	17	0	-	-	-
31	Biscuit	73	2	High moisture	-	-
32	Noodles	38	3	High Moisture, Foreign colour	1	Foreign colour presence
33	Instant noodles	36	8	High PV, High T. Ash, Mold presence	6	High PV, Mold presence
34	Black gram	33	3	Foreign colour	3	Foreign colour presence
35	Red Gram	26	1	High insect damage	-	-
36	Lentil	22	2	High insect damage	-	-
37	Semolina	16	1	High moisture	-	-
38	Bread	9	0	-	-	-
39	Green Gram	14	0	-	-	-
40	Besan	12	1	Khesari presence	1	Khesari presence
41	Split Bengal Gram	7	0	-	-	-
42	Wheat flour	6	0	-	-	-
43	Maize flour	1	0	-	-	-
44	Baby food	3	0	-	-	-
45	Pulse flour	1	0	-	-	-
46	Other cereals	1	0	-	-	-
47	Processed Drinking Water	55	28	High TMC, High Cl residue, Coliform, Low pH	28	High TMC, High Cl residue, Coliform, Low pH
48	Soft drinks	10	1	Granular solid matter	1	Granular solid matter
49	Honey	16	5	Low glucose- fructose	-	-

S.N.	Food Commodity	Total Sample	Adulterated Sample		Contaminated Sample	
			Number	Parameters	Number	Parameters
				ratio, High T. Ash		
50	Sugar	7	0	-	-	
51	Confectionary	35	2	Foreign colour	2	Foreign colour presence
52	Chewing gum	1	0	-	-	
53	Dalmoth	27	0	-	-	
54	Bhujia	20	0	-	-	
55	Laddu	26	0	-	-	
56	Pedda	2	0	-	-	
57	Soya sauce	1	0	-	-	
58	Barphi	7	1	Foreign colour	1	Foreign colour presence
59	Papad	9	1	Khesari test		Khesari presence
60	Miscellaneous food products	14	0	-	-	
62	Poultry Feed	26	14	High AIA, Low calcium, Low crude protein, Low phosphorous, High moisture	-	
63	Cattle feed	1	1	Low crude protein	-	
	Total	1061	184			

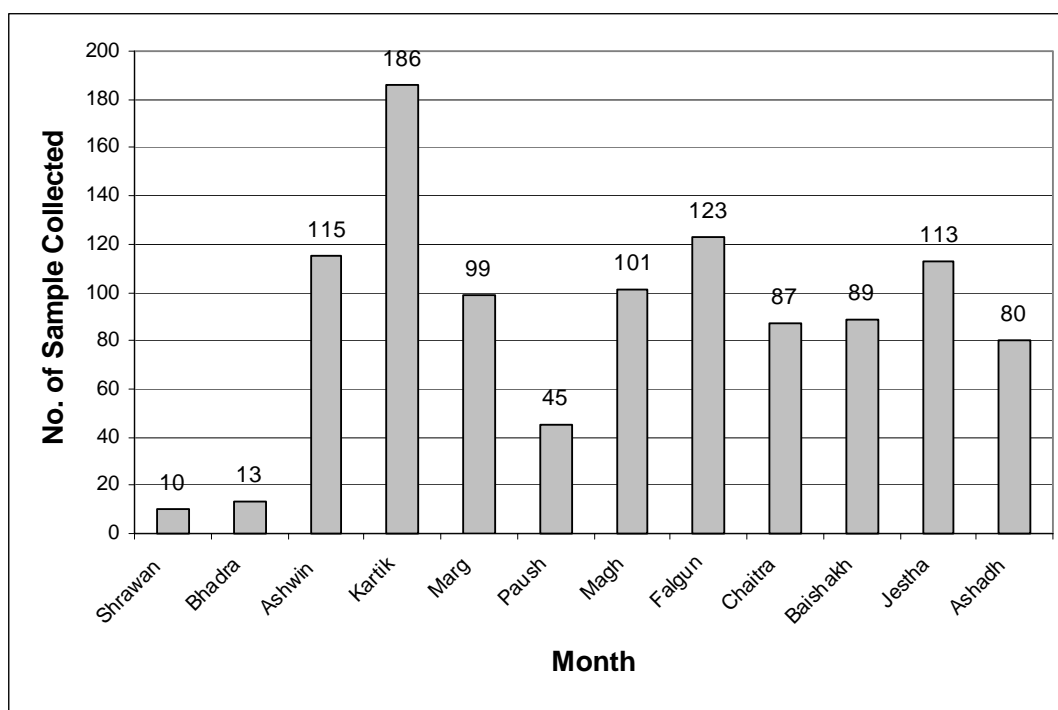


Fig.-1 Month-wise Sample Collection

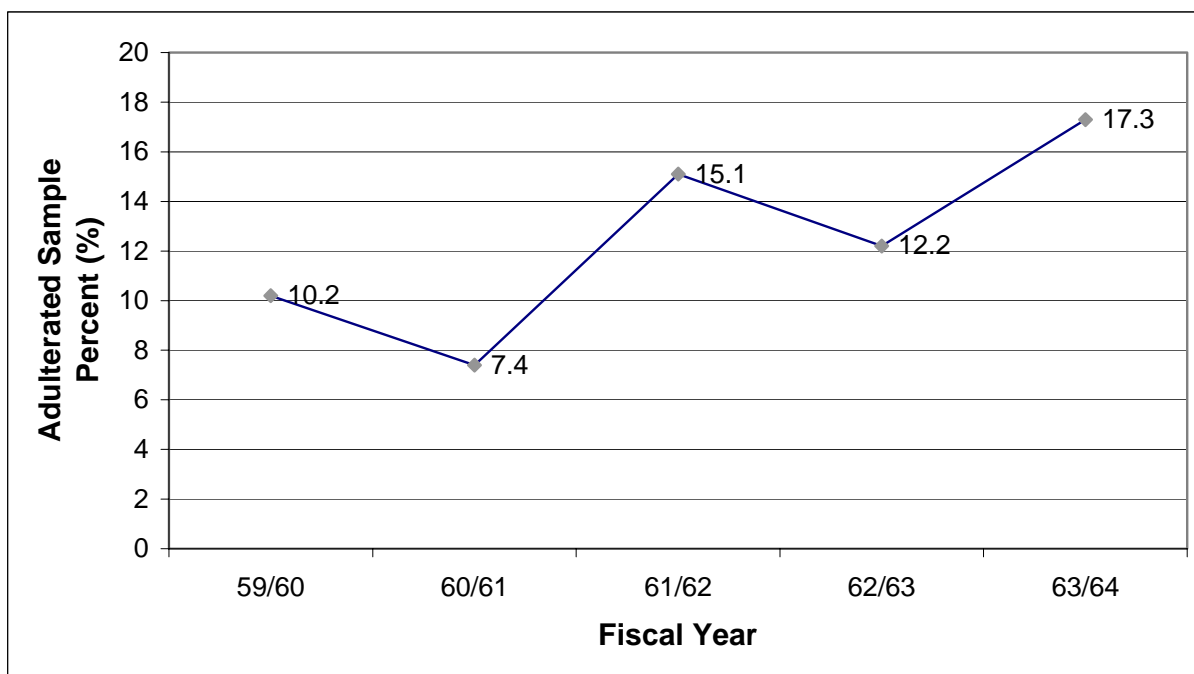


Fig.-2 Trend of Adulterated Samples on the basis of Collected Samples, Kathmandu Valley

Table-3: Industry Inspection

S.N.	Type of Industry	No. of Inspection
1	Milk & Milk Products (Milk, ghee, Khoa etc.)	30
2	Fat & Oil (Mustard Oil, Hydrogenated Oil etc.)	12
3	Fruit & Vegetable Products (Ketchup, fruit juice, squash, pickles, candy)	14
4	Spice & Condiment	6
5	Tea, Coffee, Cocoa & their products	3
6	Snacks (cheese balls, pop corn, papad, bhujia)	6
7	Bakery & Biscuits and Cookies	8
8	Noodles	6
9	Processed Drinking Water	11
10	Sweets & Confectionary	3
11	Miscellaneous Food (Mayonnaise, Porridge, Peanut butter, Pop Corn etc.)	5
12	Feed Industries	9
	Total	113

Table-4: Food Industry Licensing

S.N.	Type of Industry	Industry License			
		Renew	New	Certified	Total
1	Milk & Milk Products	18	7	14	39
2	Vegetable Fat & Oil	52	6	9	67
3	Fruit & Vegetable Products	16	2	13	31
4	Spice & Condiment	31	3	22	56
5	Tea, Coffee, Cocoa & their products	19	3	20	42
6	Snacks (Dalmoth, Bhujia, Potato chips)	13	8	9	30
7	Bakery & Biscuits and Coolies	47	7	32	86
8	Noodles	14	7	17	38
9	Processed Drinking Water	22	7	23	52
10	Soft Drink	3	1	-	4
11	Honey	3	-	3	6
12	Cereal, pulses and their products	13	6	4	23
13	Lapsi, pulses and pickles	14	11	30	55
14	Sweets & Confectionary	6	2	4	12
15	Meat Products	-	-	4	4
16	Miscellaneous (Mayonnaise, pop corn, Peanut butter etc.)	7	2	16	25
	Total	278	72	220	570

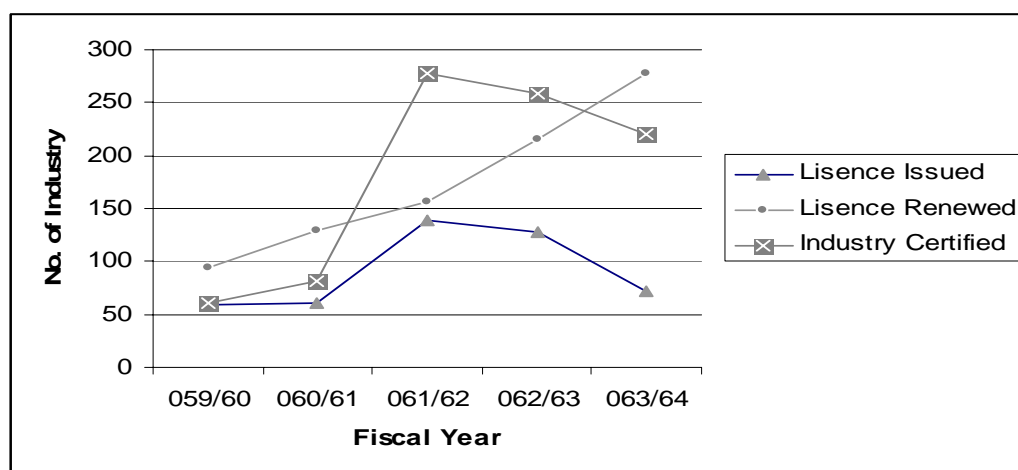


Fig.-3 Trend of Food Industry Licensing

Annex-2 : District wise sample collection

S.N.	District	Number of samples	Remarks	
1	Kabhre	28	Quality Control Division , Kathmandu	
2	Sindhupalchok	19		
3	Kathmandu valley	1014		
	Sub-total	1061		
4	Morang	159	RFTQC, Biratnagar/DFIUs	
5	Sunsari	258		
6	Jhapa	81		
7	Saptari	42		
8	Siraha	70		
9	Udaypur	61		
10	Dhankuta	49		
11	Ilam	30		
	Sub-total	750		
12	Chitwan	175		RFTQC, Hetauda/DFIUs
13	Makwanpur	44		
14	Bara	142		
15	Parsa	164		
16	Routahat	25		
17	Sindhuli	29		
18	Sarlahi	100		
19	Dhanusha	161		
20	Mahottari	40		
	Sub-total	880		
21	Rupandehi	107	RFTQC, Bhairahawa/DFIUs	
22	Kaski	120		
23	Tanahu	15		
24	Kapilvastu	80		
25	Nawalparasi	15		
26	Palpa	30		
27	Arghakhanchi	24		
28	Gulmi	19		
29	Syangja	23		
30	Myagdi	7		
31	Parbat	11		
32	Baglung	9		
	Sub-total	460		
33	Dang	100	RFTQC, Nepalgunj/DFIUs	
34	Surkhet	80		
35	Bardiya	90		
36	Banke	180		
	Sub-total	450		
37	Kailali	152	RFTQC, Dhangadhi /DFIUs	
38	Kanchanpur	99		
39	Dadeldhura	25		
40	Doti	31		
41	Baitadi	14		
42	Achham	19		
43	Darchula	10		
	Sub-total	350		
	Grand Total	3951		

Annex-3 : Mandatory Food Standards

S.N.	Food Group	No. of Standardized Food Commodity	Under Process for publication
1	Milk & Milk Products	17	1 (Paneer)
2	Fat & Oil	16	
3	Fruits & Vegetable Products	17	
4	Spices & Condiments	20	1 (Cinnamon Powder)
5	Tea, Coffee & their Products	3	
6	Salt	2	
7	Cereal, Pulses & their Products	19	2 (Maize & Wheat)
8	Processed Drinking Water	1	
9	Sweetening Agent	3	
10	Sweets and Confectionary	3	
	Total	101	

(Voluntary Standard for fortified wheat flour is also under process of Notification)

Annex-4 : Analysis Report of Central Food Laboratory

Table 1: Summary of Analysis of Pasteurized Milk

Industry code Parameters	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Fat %																		
Max	2.8	3.1	3.0	3.0	2.8	2.7	3.5	2.8	2.0	3.5	2.7	3.2	3.0	3.3	3.2	2.7	3.8	
Min	2.5	2.6	2.5	3.0		2.6				2.1	2.5	3.0				2.5		-
Mean	2.6	2.9	2.6	3.0		2.6				2.8	2.6	3.0				2.6		
SNF %																		
Max	8.0	8.9	8.5	8.5	8.2	8.0	8.7	8.1	7.4	8.7	9.7	8.8	8.1	8.4	10.0	8.4	9.2	
Min	6.6	7.6	8.0	8.3		8.0				8.3	8.7	8				8.1		-
Mean	7.6	8.2	8.3	8.4		8.0				8.5	8.9	8.2				8.2		
S1/S2 due to Fat % and SNF %	5/3	11/1	5/0	3/0	1/1	2/2	1/0	1/1	1/1	2/1	2/2	5/0	1/0	1/0	1/0	3/3	1/0	
Microbiological analysis results S1/S2 Coliform / ml	2//0 -ve	9/0 -ve	1/0	1/0	2/0	-	-	-	-	2/1 >2400	-	3/3 >2400	-	1/0	1/0 -ve	-	2/1 >2400	4/0 - ve

Note : Max- Maximum; Min- Minimum; S1- Number of sample analyzed; S2- Number of substandard sample, 1-Dairy Development Corporation, 2- Himalaya dairy, 3- Sitaram Dairy, 4- Nepal Dairy, 5 – Metro , 6- Anmol Dairy, 7- Kharipati Dairy, 8- Adhunic Dairy, 9- Puspa Dairy, 10- Nava Pravat , 11- Amrit , 12- Snow Fun, 13- Shital, 14- Rajdhani, 15- Bajrajogini, 16- Kalika Dairy, 17- Everest Dairy , 18- Fluid milk.

Table 2: Summary of Analysis of Milk Products

Commodities Parameter	SMP	Ice cream	Paneer	Yoghurt	Cheese	Khoa	Chhurpi	Condensed milk	Dairy whitner	Cerelac
S1/S2%	7/28.5	6/0	1/0	1/0	1/0	4/0	2/0	5/20	2/0	1/0
Moisture%										
Max	4.0	80.0	54.9	84.3	34.6	-	15.0	27.7	3.0	1.5
Min	2.8	63.8					14.0	25.0	2.0	
Mean	3.5	52.3					14.5	25.9	2.5	
Fat%			25.0				ND		19.0	
Max	0.51	28.0		3.0	24.0	-		9.0	18.5	9.3
Min	ND	10.0						8.0	18.75	
Mean		15.9						8.5		
SNF%								25.9		
Max	-	-	-	-	-	-	-	18.7	-	-
Min								22.9		
mean										
Acidity%										
Max	1.4			1.05	0.97	-	-	-	0.92	-
Min	0.7	-	-						0.92	
Mean	1.0								0.92	
Protein%										
Max	39.6	9.5	14.5		27.6	-	58.0	-	23.7	17.8
Min	10.7	2.3					55.8		20.0	
Mean	31.5	5.0					56.9		21.8	
Sugar%										
Max	-	-	-	-	-	-	-	44.7	-	-
Min								40.4		
Mean								42.4		
Total sugar										
Max	-	-	-	-	-	22.0	-	-	-	-
Min						19.4				
Mean						20.5				
Microbiological analysis										
S1/s2	7/0	6/2	2/210 ¹	3/2	2/0	-	3/0	1/0	2/0	-
TPC/g	8 X 10 ² -10 ¹ 56 X 10 ²	49 X 10 ¹ -79 X 10 ¹	12 X10 ¹	12 X 10 ² -64 X10 ²	37 X 10 ¹		-ve	47 X 10 ¹	3 X 10 ¹ -93 X 10 ¹	
Coliform/g	-ve	49 X 10 ¹ -58 X 10 ¹	9 X 10 ² 24 X 10 ²	7 X 10 ² -31 X 10 ²	-ve		-ve	-ve	-ve	

Note: Max- Maximum, Min- Minimum, S1- Number of sample analyzed, S2-Percentage of substandard samples, SMP-Skimmed milk powder, SNF-Solid not fat, TPC-Total plate count

Table 3: Summary of Analysis of Fats and Oil

Commodities Parameters	Rape/Mustard oil	Soyabean oil	Ghee	Veg.Ghee	Palm oil *	Palmolein	Sunflower oil
S ₁ /S ₂	115/18	39/6	46/22	42/15	11/0	2/0	33/15
R.I.(at 40°C)							
Mean	1.4676	1.4688	1.4568	1.4688	1.4565	1.4609	1.4688
Max	1.4690	1.4696	1.4606	1.4606	1.4570	1.4610	1.4690
Min	1.4650	1.4682	1.4550	1.4576	1.4560	1.4608	1.4680
Acid Value							
Mean	3.36	0.29	2.61	0.49	0.28	0.16	0.19
Max	7.46	0.79	8.86	1.24	0.56	0.18	0.86
Min	0.22	0.10	0.52	0.21	0.17	0.13	0.10
Iodine value							
Mean	115.19	128.51			53.53	56.43	126.71
Max	139.4	138.78	-	-	57.77	57.97	137.0
Min	88.96	121.63			51.31	54.89	118.94
Sap. Value							
Mean	170.59	190.3			197.19	-	188.62
Max	193.0	193.9	-	-	197.64		191.09
Min	168.0	189.0			195.75		188.0
moisture%							
Mean			0.62	0.07			
Max	-	-	13.78	0.19	-	-	-
Min			0.02	0.02			
R.M. value							
Mean			22.24				
Max	-	-	33.5	-	-	-	-
Min			0.02				
Melting							
Mean				39.35	31.19		
Max	-	-	-	47.0	35.7	-	-
Min				35.0	20.0		
Peroxide value	-	-	-	-	-	-	17.36 62.0 2.01

Note : R.I.= Refractive Index: Sap.value = Saponification value: R.M.value=Reichert Meissel value:
Max.=Maximum: Min=Minimum: S₁=Number of sample analyzed: S₂=Number of substandard samples= *- R.I.
at 50°C

Table 4: Summary of Analysis of Sweets and Sweeteners

Commodities Parameters	Honey	Chewing gum and Bubble gum	Confectionaries	Milk Candy	Sugar, Mishri, Malasses Chakku and Glucose
S ₁ /S ₂	-	1/0	34/4	10/0	-
Moisture %					
Max.	24.35	2.72	—	—	—
Min.	11.47	—	—	—	—
Mean.	20.14	—	—	—	—
Total ash %	S. a	(S.a)	(S.a)	(S.a)	S.a
Max.	-	7.91	2.48	1.63	-
Min.	-	-	0.12	0.25	-
Mean.	-	-	0.93	1.03	-
Sucrose %					
Max.	11.98	64.24	-	-	-
Min.	0.14	-	-	-	-
Mean.	6.46	-	-	-	-
Reducing sugar %					
Max.	84.32	5.09	-	-	-
Min.	60.04	-	-	-	-
Mean.	73.14	-	-	-	-
Extraneous matter					
Max.	0.09	-	-	-	-
Min.	0.05	-	-	-	-
Mean.	0.14	-	-	-	-
Preservative (ppm)			(So ₂)	(So ₂)	
Max.	-	-	28.44	traces	-
Min.	-	-	traces	-	-
Mean.	-	-	-	-	-
Water insoluble solid %					
Max.	3.27	-	-	-	-
Min.	0.01	-	-	-	-
Mean.	1.17	-	-	-	-
Acid insoluble ash %					
Max.	-	-	0.52	0.19	-
Min.	-	1.05	0.02	0.05	-
Mean.	-	-	0.19	0.10	-
Acidity %	(as F.a)				
Max.	1.6	-	-	-	-
Min.	0.01	-	-	-	-
Mean.	0.45	-	-	-	-
Color	-	ND	sunset-yellow, Fast green, Max 186.4-23.02	-	-
Protein %					
Max.	-	-	-	8.17	-
Min.	-	-	-	3.95	-
Mean.	-	-	-	5.07	-
Fat %					
Max.	-	-	-	42.0	-
Min.	-	-	-	4.0	-
Mean.	-	-	-	11.6	-
Gum %	-	21.48	-	-	-
F/G ratio Max	3.56	-	-	-	-
Min	0.66	-	-	-	-
Mean	1.13	-	-	-	-

Note: F/G ratio = Fructose/ Glucose ratio, S.a=Sulfated ash. F.a=Formic acid

Table 5: Summary of Analysis of Fruits and Vegetables Products

Commodity	Tomato ketchup and Chilli sauce	Pickles	Squash, juice, sarbat	Jam, Jelly and Fruit drink	Fruit juice concentrate	Carbonated beverage	Mayonnoise	Coconut milk	Well AM and PM	Chilli	Purity of KMS	Soya sauce
Parameters												
S ₁ /S ₂	30/27	49/21	116/20	10/0	1/0	7/0	3/0	1/0	2/0	2/0	2/0	5/0
Color	Sunset yellow, Panceus, Tartazene, Carmoisine, Amarant hus	Turmeric	Sunset yellow, Tartazine, Tartazene	Carmoisine,	-	-	-	Fat 13 %, TS 1.81%	Sugar _ve	-	-	-
Preservative (ppm)	(B.a)	(B.a)	(So ₂)	(So ₂)	(So ₂)	ND	(B.a)	-	So ₂ ND	494.0	-	(B.A)
Max.	439.69.0	753.69	515.17	33.82	-		485.4			94.1-		182.1
Min.	0	60.61	ND	ND								3
Mean.	50.30	73.00	-	-								-
	249.00											-
Acidity %	(as C.a)	(as.A.a)	(as C.a)	(as C.a)	(as C.a)	0.26	-	-	ND	-	-	2.30
Max.	2.48	3.59	3.35	1.17	1.07	0.02	-	-				2.24
Min.	0.63	0.14	0.27	0.29		0.14	-	-				
Mean.	1.15	0.84	-	-			-	-				
TSS %							-	-	-	-	-	65.00
Max.	39.75	-	47.75	72.5	25	12.0	-	-	-	-	-	29.67
Min.	6.75		11.79	64.8		9.5	-	-	-	-	-	
Mean.	8.00		-	-		10	-	-	-	-	-	
Fill of the Container %	>90	>90	>90	>90	-	>90	>90	-	-	-	-	>90
Saccharine						ND						-

Note: S₁ = Number of sample analyzed. S₂ = Number of sample sub-standard Max= Maximum Min = Minimum, C.a = Citric acid B.a= Benzoic acid, D.W =Drain weight, N.W. = Net weight, TSS= Total soluble solid, So₂= Sulphur -dioxide. NaCl =Sodium chloride.

Table 6: Summary of Analysis of Cereals and Cereal products

Commodities→ Parameters↓	Instant Noodles	Stick Noodle	Dalmo Bhujia Chips	Papa Raha Dal	Bason	Biscuit	Bread	Maida	Pitho	Samolina	Miscellaneous*
S ₁ / S ₂	66/8	63.2	68/1	28/1	13/1	95/3	51/3	15/5	2/0	17/1	36/0
Moisture											
Min	4.1	12.3	-	-	12.8	11.02	-	15.15	11.03	15.33	
Max	2.1	3.8			7.7	2.91		0.08	10.69	11.22	
Mean	2.9	10.8			10.5	0.53		9.12	10.86	13.33	
Total ash											
Min	4.0	3.2	-	-	2.9	-	-	0.78	2.53	0.67	-
Max	2.1	0.86			1.41			0.32	0.09	0.4	
Mean	3.4	0.4			2.39			0.76	1.63	0.54	
AIA											
Min	0.1	0.1	-	-	0.14	0.11	0.2	0.08	0.1	0.07	-
Max	0.06	0.08			0.04	0.05	0.02	0.01	0.04	0.01	
Mean	0.08	0.07			0.08	0.01	0.07	0.06	0.07	0.05	
Acid											
Min	-	-	-	-	-	-	-	-	-	-	-
Max											
Mean											
Protein											
Min	11.4	10.1	-	-	-	-	-	-	-	-	---
Max	10.5	8.8									
Mean	10.9	9.6									
Khesari Test (Positives)	-	-	+ve	+ve	+ve	-	-	-	-	-	-
AEF %											
Min	-	-	-	-	-	1.54	-	-	-	-	-
Max						0.25					
Mean						0.65					
Alc.Acidity %											
Min	-	-	-	-	0.14	-	11.88	0.06	0.13	0.06	-
Max					0.09		0.01	0.02	0.05	0.02	
Mean					0.03		2.13	0.04	0.09	0.04	
Gluten %											
Min	-	-	-	-	-	-	-	11.83	13.99	9.5	-
Max								10.41	8.78	4.86	
Mean								11.21	11.39	7.79	

Note : S₁ =Total numbers of samples, S₂ - Total numbers of substandard samples AIA = Acid Insoluble Ash; Max =Maximum ; Min = Minimum., Trace= Less than 0.01%

* = Miscellaneous samples include prawn, corn flakes, titaura, masyaura, cheese ball, cheese powder, chips, crackers

Table 7: Summary of Analysis Results of Tea, Herbal Tea and Coffee

Parameters	Tea			Herbal Tea			Coffee			
	S ₁ / S ₂	73/3			5/-			9/0		
		Min.	Max.	Mean	Min.	Max.	Mean	Min	Max.	Mean
Moisture,%		4.51	10.31	6.68	3.54	6.85	5.31	1.62	12.0	6.5
Total Ash,%		5.65	8.00	6.54	11.42	9.64	13.55	2.16	5.73	4.12
Alkalinity of Ash, %		1.51	2.00	1.67	1.49	2.87	1.49	1.88	2.10	1.89
Water soluble Ash %		41.35	87.84	59.77	15.48	62.31	39.17	61.61	92.51	87.63
Acid Insoluble Ash %		0.04	1.0	0.01	0.24	4.11	1.72	0.02	0.01	0.73
water extract %		35.00	45.77	38.28	27.55	50.28	31.72	24.47	53.50	28.12
Crude fiber %		10.30	14.85	11.81	17.22	22.4	19.95	-	-	-
Caffeine %		1.58	3.57	2.27	nd	-	nil	0.74	1.55	1.48

Note: S₁ =Total no. of sample S₂ = No. of Substandard sample

Table 8: Summary of Analysis Results of Spices

Commodities Parameters S1/S2	Turmeric powder 41/0	Coriander powder 25/1	Cumin powder 61/6	Chilly powder 54/3	Mix masala 13/6	Pepper powder 1/0	Dried ginger 3/2	Cinamom powder 1/0	Fennel 34/0	Timur 1/0	Timur 1/0
Moisture % Max Min Mean	9.0 5.0	8.0 5.0	10 5.0	9.0 5.0	9.0 6.0	8.0	9.0 7.0	2.42	10.0 7.0	-	-
Total Ash % Max Min Mean	5.03 8.8	6.47 4.24	10.05 5.12	8.0 4.0	9.37 5.05	3.38	10.49 5.29	0.49	10.41 7.32	5.44	4.0
AIA% Max Min Mean	1.34 0.18	0.53 0.11	1.28 0.09	0.80 0.10	1.07 0.14	0.15	4.1 0.65	-	0.47 0.11	0.09	0.11
Lead chromate test	-ve	-	-	-	-	-	-	-			
crude fiber % Max Min Mean	- - -	- - -	- - -	28.18 16.65	15.00 9.77	18.0	- - -	- - -			
Volatile oil% Max Min Mean	- - -	0.50 0.10	1.25 0.45	- -	1.05 0.26	-	1.5 1.0	-	1.65 1.0	1.0	0.25
NVEE % Max Min Mean	- - -	- - -	- - -	15.14 9.90	16.84 6.01	4.13	- - -	- - -			
Cur cumin% Max Min Mean	3.85 1.28	- - -	- - -	- - -	- - -	- - -	- - -	- - -			
Salt % Max Min Mean	- - -	- - -	- - -	- - -	7.52 0.28	- - -	- - -	- - -			
Cold water soluble extract							1.6 0.16	-			
Alcohol extract							7.4 5.7	-			
Calcium as Cao							2.31	-			
Reason		Low volatile oil	Low volatile oil and high TA	Low non volatile oil	Low volatile and non volatile oil, high salt	Low non volatile oil	High TA and AIA	-			

Note : S1 =Total no. of sample S2 = No. of Substandard sample, NVEE-Non volatile ether extract, AIA= Acid insoluble ash

Table 9: Summary of analysis results of salt

Types of salt S ₁ /S ₂	Common Salt		
	23/5		
Parameters	Min	Max	Mean
Moisture,%	0.20	1.19	0.58
Iodine(ppm)	7.11	68.8	48.20
Chloride as sodium Chloride %	91.83	99.58	98.3
Water Insoluble matter %	0.10	0.76	0.41
Water Soluble other than sodium chloride %	0.38	3.39	1.28

Table 10: Summary of analysis of drinking water

Parameters	Unit	Maximum	Minimum	Mean
PH (25°C)	-	8.3	5.2	6.95
TDS (25°C)	ppm	372.8	3.967	92.66
Ammonia (Qlt-Test)	-	+ve	ND	-
Sulphate (Qlt-test)	-	28.68	ND	-
Hardness as CaCO ₃	Ppm	268	2	36
Alkalinity as HCO ₃	ppm	280.6	6.1	42.2
Iron	ppm	9.2	ND	0.096
Chloride	ppm	113.98	1.98	31.0
Calcium	ppm	40.0	ND	6.88
Magnesium	ppm	8.89	0.06	3.96
Zinc	ppb	1.99	ND	0.68
Lead	ppb	-	-	ND
Cadmium	ppb	-	-	ND
Arsenic	ppb	30	ND	N-
Micro-organisms				
Total Mesophilic Count	Per ml	39 X 10 ³ (2)	-	-
Faecal Coliform	Per 100ml	>2400(4)		
E. coli	Per 100ml	>2400(4)		
Bacillus	Per 100ml	+Ve (6)		
Yeast and Mold	Per 100ml	8 X 10 ¹ (8)		
	Per ml	13 X 10 ¹ (8)		

Note: ND= Not detected, ppb- Parts per billion, ppm= Parts per million, TDS= Total dissolved solid, Qlt= Qualitative test

Table 11: Summary of Grading Results of Cereals, Pulses and Spices

Commodity Parameters	Rice	asdf	Soyabean dal	asdf	Aniseed	Split lentil	Rahar	Green gram	Split Black gram	Cumin	Maize	asdf
S1/S2	19/00	1/00	1/00	34/0	5/00	22/0	24/1	7/00	28/0	1/00	-	5/-
Moisture (%)	12-12.5	8.82	12.06	10.92-14.0	2.52-19.01	9.04-13.42	8.94-13.7	12.43-12.85	6.92-14	-	10	11.05-13.5
O.F.M.	0.04-0.62	ND	ND	0.04	0.18-8.05	0.04-0.2	0.11-0.12	0.08	0.04-0.16	0.04	ND	ND
I.F.M.	0.08-0.2	ND	ND	0.04	0.03-1.98	0.02-0.12	0.0-0.06	0.02-0.08	0.02-0.12	-	ND	ND
I.D.	0.2	0.35	15.4	0.2-0.86	0.38-2.7	0.1-2.92	0.05-0.84	0.08	0.04-0.34	-	2.08	0.08-0.78
O.E.G.	ND	ND	ND	0.04-0.22	1.71-15.02	0.08-1.04	0.08-1.32-0.09	0.04-0.08	0.04-0.18	-	ND	0.04
Damaged	0.04-3	0.34	3.40	0.48-2.4	1.50-1.12-0.53	0.04-1.62	0.2-4.14	0.80-1	0.04-2.2	-	5.08	0.16-0.85

Note : S₁ = Number of sample analyzed; S₂= Number of substandard samples; O.F.M = Organic foreign matter; I.F.M = Inorganic foreign matter; O.E.G= other edible grain; I.D = Insect damaged.

Table 12: Summary of Analysis Results of Color

Varieties of Commodities	S ₁	S ₂	Color used	
			Edible	Non-edible
Black gram	12	4	- unidentified black color	
Peda	2	0	Tartazine	-
Laddu	25	0	Tartazine Sunset- yellow	-
Burfi	7	1	Tartazine,fast green	-
Chocolate	2	2		Rhodamine B
Yellow lentil	2	0	ND	-
Dalmoth/Bhujia	3	0	Brilliant blue, Tartazine	-
Cone	2	2	Sunset yellow	-
Jam	3	0	Carmosine, Amaranth	-
Noddles	2	2	Tartrazine	-
Titaura	2	0	Carmosine, Panceau, Sunset yellow	-
Chilly powder	1	0	ND	-
Other sweets	14	0	Sunset yellow Tartazine and	-
Cheese balls	1	0	Sunset-yellow and Carmoisine	-
color	1	1	Tartrazine, sunsert yellow	-
Nimki	3	0	Tartazine, Sunset-yellow	-
Juice/drink	3	0	Sunset yellow	-
Total	85	12		

Table 13: Summary of Analysis Results of Miscellaneous Products

Commodities Parameters	N	Moisture %	Fat %	Protein %	Total ash %	Crude fibre %	Carbohydrate %	Energy Kcal/100g	Ca g%	P g %	Iron mg %	Acidity %	Vit C mg/100g	AIA %
Noodle	2	8.4-5.8	-	-	-	3.2-0.21	-	-	-	-	-	-	-	-
Meusli	2	3.9-2.9	-	-	-	-	-	-	-	-	-	-	-	-
Porridge	2	4.5-3.2	-	-	-	-	-	-	-	-	-	-	-	-
Peanut	4	2.3-1.3	54.6-48.5	34.93-31.1	2.64-2.25	1.6- 0.39	-	654.0-600.0	Broken 1-0.82	-	-	-	-	-
Nutrella	15	13.7-7.4	1.72-0.4	61.7-53.2	6.77-5.94	1.8-0.44	-	-	-	-	-	-	-	1.11-1.0
Jandh	2	95.9-94.3	0.76-0.74	2.1-1.8	0.7-0.48	ND	-	2.6	24.3-17.0	1.8-1.2	0.02-0.01	-	0.01-0.11	0.42-0.26
Pears juice	1	94.7	-	-	-	-	-	-	-	0.41	-	-	-	-
Banana	13	-	-	-	-	-	-	-	-	90-45	-	-	-	-
Auvit	1	16.3	0.32	2.8	0.16	ND	80.42	-	6.16	-	10.08	-	-	-
Aloo powder	1	10.7	-	7.9	-	-	-	-	-	-	10.0	-	-	-
Sisnu powder	1	12.2	-	33.7	-	-	-	-	-	-	25.1	-	-	-
Aloo + Sisnu powder	1	11.2	-	24.0	-	-	-	-	-	-	15.8	-	-	-
Rithha fruit	1	6.4	24.6	26.5	3.4	-	-	-	0.7	0.21	10.9	1.68	-	.052
Sohan Papadi	1	1.75	25.9	6.3	0.35	2.1	63.5	512.8	-	-	-	-	-	-
Champion	1	5.9	--	18.8	-	-	71.0	-	-	-	-	-	-	-
Diabetic dietic diet	1	6.7	3.7	15.0	-	4.3	73.0	386.0	0.49	0.41	95.0	-	-	-
Rapseed Gundruk	1	8.0	2.1	30.6	12.1	15.8	39.3	-	-	-	-	-	-	-
Radish Gundruk	1	6.9	1.4	19.2	16.1	20.5	42.6	-	-	-	-	-	-	-
Mustard Gundruk	1	6.6	2.9	36.6	14.9	14.2	31.2	-	-	-	-	-	-	-
Mineral powder	4	-	-	-	-	-	-	-	14.4-0.61	2.3-0.2	-	-	-	-
Herbs paste	1	-	-	-	-	-	-	-	7.5	0.8	-	-	-	-
Well AM	1	4.4	-	9.0	-	-	-	-	-	-	-	-	-	-
Well PM	1	3.4	-	9.0	-	-	-	-	-	-	-	-	-	-
Used Veg. Oil	1	0.05	99.7	ND	ND	ND	ND	895.7	-	-	-	-	-	-
Lito	29													
Max		9.3	11.6	28.0	7.8	3.2	77.1	427.0	1.5	-	70.4	1.35	49.1	-
Min		1.5	2.1	14.7	2.0	0.2	55.6	402.7	0.45	-	7.91	0.05	14.5	-
Mean		5.5	6.7	22.4	4.2	0.92	60.0	412.3	0.32	-	37.5	0.39	-	-

Note: Max- Maximum, Min- Minimum, AIA- Acid insoluble ash, Ca- Calcium, P- Phosphorus, N- Total number of sample

Table-14 .Summary of Microbiological Results of Food and Food Products

Commodities	S1/S2	TPC/g m	Coliform/g m	Yeast/g m	Mold/g m	Staphy lococ cus/ 0.2gm	Salmon ella/g m	Clostrid ium/g m
Cereal and cereal products	43/32	78X10 ¹ - 11X10 ⁴	4X10 ¹ - 39X10 ³	-ve	6X10 ¹ - TNTC	+ve (1)	-ve	-ve
Meat and Meat Products	27/17	20X10 ¹ - 68X10 ³	18X10 ¹ - 1.9X10 ⁴	-ve	1X10 ¹ - TNTC	+ve (7)	+ve (2)	-ve
Bakery products	17/7	13X10 ¹ - 52X10 ²	9X10 ² 12X10 ²	-ve	8X10 ¹ -TNTC	+ve (2)	-ve	-
Herbal tea	6/0	4X10 ¹ - 65X10 ¹	-ve	-ve	-ve	-ve	-ve	-
Instant noodles	27/10	32X10 ¹ - 45X10 ²	6X10 ¹ - 17X10 ²	-	6X10 ¹ - 14X10 ²	-ve	-ve	-
Gundruk	6/2	42X10 ² - 12X10 ³	-ve	-ve	18X10 ¹ - 11X10 ²	-ve	-ve	-
Snack foods	9/45	8X10 ¹ - 18X10 ³	43X10 ¹ - 46X10 ³	-ve	7X10 ¹ - 14X10 ¹	-ve	-ve	-
Sweets	11/4	4.4X10 ¹ - 9X10 ²	2X10 ¹ - 77X10 ¹	-ve	2X10 ¹ -	-ve	-ve	-
Soft drinks	53/4	2 - 97X10 ⁴	-ve	-ve	-ve	-ve	-ve	-
Soup	6/0	-	-	-	-	-	-ve	-
Mayonaise	4/2	16X10 ² - 81X10 ³	17X10 ¹	26X10 ¹	-ve	-ve	-ve	-
Jam	6/1	5X10 ¹ - 24X10 ²	7X10 ²	-ve	-ve	-ve	-ve	-
Tomato Ketchup	19/0	All samples were found to be within minimum standard.-						
Miscellaneous samples *	31/7	5X10 ¹ - 47X10 ²	4X10 ¹ - 7X10 ²	-ve	2X10 ¹ - TNTC	-ve	-ve	-

Note: Miscellaneous samples include: Chilli sauce, Soya sauce, Coconut milk, Pustakari, Maseura, Candy, Pickles, Seasoning powder, Used vegetable oil, Pellet, Instant noodles, Well tablets, Pudín pearls, Turmeric powder, Vegetable drinks.
TNTC = Too Numerous To Count, S. aureus- Staphylococcus aureus, E. coli – Escherchia coli.

Table 15: Summary of Analysis Results of Radiation

Commodity	No of samples	Radioactivity Bq/Kg
Lentil	21	3-78
Skim milk powder	3	0-113
Coke concentrate	6	5-106
Soup powder	4	37-58
Malt	10	14-135
Total	44	

Table16: Summary of Analysis Results of Aflatoxin

Commodities	S1/S2	Aflatoxin in ppb	
		B1	B2
Beaten wheat	1/0	ND	ND
Feed	7/1	ND-15	ND-114
Peanut	3/0	ND	ND
Muesli	4/0	ND	ND
Porridge	4/0	ND	ND
Dal moth	4/0	ND	ND
Mix flour	1/0	„	„
Weaning food (litto)	14/0	„	„
Peanut butter	1/1	37	„
Maize	8/0	„	„
Maize flour	1/0	„	„
Ritha	1/0	„	„
Flour	4/0	„	„
Flour with sugar	1/0	„	„
Wheat flakes	1/0	„	„
Skimmed milk powder	2/0	„	„
Herbo prash powder	1/0	„	„
Total	53/2		

Table 17: Summary of Analysis Results of Pesticide Residue

Commodities	S1/S2	Pesticide residue , ppm				
		DDT	BHC	Parathion	Methyl parathion	Malathion
Tea	1/0	ND	ND	-	-	-
Soft drink/ coke/ pepsi	27/0	ND	ND	ND	ND	ND
Icecream	1/0	„	„	„	„	„
Curd	1/0	„	„	„	„	„
Wheat flour	4/0	„	„	„	„	„
Weaning food/ lito	13/0	„	„	„	„	„
Ritha	2/0	„	„	„	„	„
Skim milk powder	2/0	„	„	„	„	„
Milk	4/0	„	„	„	„	„
Gundruk	1/0	„	„	„	„	„
Leaf cup	1/0	„	„	„	„	„
Water	1/0	„	„	„	„	„
Total	58					

Note: S1/S2 – Total number of sample/ substandard samples

Table 18: Summary of Analysis Results of Heavy Metals

Sample Type	No.of sample / Code No.	Parameter analysed				Remarks
		Heavy metal		pH	Others	
Banana	14	As,.	-	-	-	Max 30- min ND
Litto	12	-	AS, Pb, Cd, Zn, Cu	-	-	As, Pb, Cd= ND, Cu=13.69 Max-, ND min, Zn= 192 Max mg/l 5.86 Min mg/l
Sisno powder	1	Cd,Pb.As	-	-	-	ND
Milk	2	Pb, Cd, As	-	-	-	ND
Ritha	2	Cd,Pb	-	-	-	ND
Sulphur	2	-	Pb, Cd, Sulphur %, As	-	-	Pd, Cd ND, Sulphur = 30 % As = 30 ug/l
Raw Milk	4	As,Fe, Pb	-	-	-	Pb-ND, As- 10 ug/l, Fe- 6.63 mg/l Max 2.46 mg/ l Min
Fanta	1	Pb, Cd, As, Cu	-	-	--	ND
Herbopras paste	3	As,Cd,PbCu	-	-	-	ND
Total	41					

Table 19: Summary of Analysis Results of Feed Ingredients

Type of ingredients Parameters	No of the sample	Moisture %	Fat %	Protein %	AIA %	Crude fibre%	Calcium %	Phosphorus %
Bone meal	3	7.15-3.94	-	-	30.9-0.95		11.7-5.8	5.95
Marble dust	2	2.04-1	-	-	-		20.26-9.72	0.47
Soyabean cake	3	-	-	56.9	-		-	-
Vitamin	1	-	-	9.2	-		-	-
Stone dust	2	-	-	-	-		7.16	0.076
DCP	1	-	-	-	-		36.0	-
Soyabean meal	1	10.94	1.44	52.07	-	5.81	-	-
Dhuto (Bran)	2	16.37	-	-	-	-	-	-
Stone dust	2	-	-	-	-		7.16	.076
Dolomite	1	0.2	-	-	18.6	-	16.73	0.09
Rice polish	4	12.59-7.99	17.8-9.16	14.66-9.80	-	20.9-4.12	-	-

Table 20: Summary of Analysis Results of Feed (poultry, cattle, and pig feed)

Types of feed Parameter	B1	B2	L1	L2	L3	Cattle feed
S1/S2	22/14	27/11	8/8	2/1	5/1	8/8
Moisture %						
Max	11.77	11.9	11.0	9.69	10.36	8.08
Min	5.6	7.18	8.59	8.13	7.66	
Mean	9.79	9.62	9.84	8.91	8.8	
Fat %						
Max	5.25	7.64	5.26	1.88	3.59	8.87
Min	4	3.48	0.62		1.75	
Mean	4.57	4.87	3.47		2.85	
Protein %						
Max	29.95	31.4	29.37	13.01	24.98	16.57
Min	2.4	16.77	12.6		13.88	
Mean	22.6	21.61	20.6		20.62	
Crude fibre%						
Max	7.4	8.04	7.44	4.5	5.13	5.56
Min	3.15	3.04	3.51		3.82	
Mean	4.89	5.03	5.04		4.28	
Calcium%						
Max	1.75	3.03	3.34	3.37	3.89	0.76
Min	0.49	0.8	0.98	2.49	0.88	
Mean	1.17	1.29	1.99	2.93	2.53	
Phosphorus %						
Max	7.44	7.2	0.85	0.93	0.66	0.57
Min	0.34	0.23	0.31	0.59	0.34	
Mean	1.53	1.28	0.69	0.76	0.56	
AIA%						
Max	3.96	6.2	4.55	3.55	4.97	4.13
Min	1.17	1.02	0.55	2.33	1.65	
Mean	2.68	2.52	2.37	2.94	3.31	
Sodium chloride%						
Max	1.0	1.05	0.81	0.43	0.63	0.64
Min	0.07	0.33	0.45		0.54	
Mean	0.59	0.59	0.65		0.59	

Note: S1- Total number of sample analyzed, S2- number of substandard sample, Max- maximum, Min- minimum, L1- layers 1, L2- layers 2, L3- layers 3, B1- broiler 1, B2- Broiler 2, B3- Broiler 3, AIA- acid insoluble ash

Annex -5 : Performance of different laboratories under DFTQC

Table 1: Performance Based on Super Flour (*Sarbottam Pitho*)

Laboratory	No of Samples	Lito (Sarbottam Pitho)		
		Moisture (%)	Protein db (%)	Fat db (%)
Reference Lab	11	3.9	26.3	8.95
Central Food Lab	6	2.52	26.5	8.88
Nutrition Lab	6	2.68	23.34	10.43
RFTQC, Hetauda	6	3.28	22.67	9.89
RFTQC, Biratnagar	6	3.33	20.45	9.21
RFTQC, Bhairahawa	6	2.46	22.57	9.44
RFTQC, Dhangadhi	6	3.24	22.14	9.2
RFTQC, Nepalgunj	6	2.36	Not Available	Not Available
FQL, Kakarvita	6	3.1	Not Available	9.2
FQL, Tatopani	6	3.26	19.66	8.5
NSBM	6	2.48	26.27	9.44
DDC	6	2.27		
FQL, Mahendranagar	6	2.12	Not Available	9.33

Table 2: Performance Based on Oil

Laboratory	Sunflower oil		Soyabean oil	
	Refractive Index	Peroxide Value	Refractive Index	Peroxide Value
Reference Lab	1.4698	12.08	1.4686	25.70
Central Food Lab	1.4690	6.58	1.4688	22.62
RFTQC, Hetauda	1.4667	9.97	1.4670	35.69
RFTQC, Biratnagar	1.4692	20.75	1.4690	34.12
RFTQC, Bhairahawa	1.4660	46.07	1.4658	52.46
RFTQC, Dhangadhi	1.470	25.55	1.470	51.3
RFTQC, Nepalgunj	1.4687	Not Available	1.4688	Not Available
FQL, Kakarvita	1.4662	16.16	1.4660	30.14
FQL, Tatopani	Not Available	4.12	Not Available	15.72
FQL, Mahendranagar	1.4711	84.37	1.4710	46.86

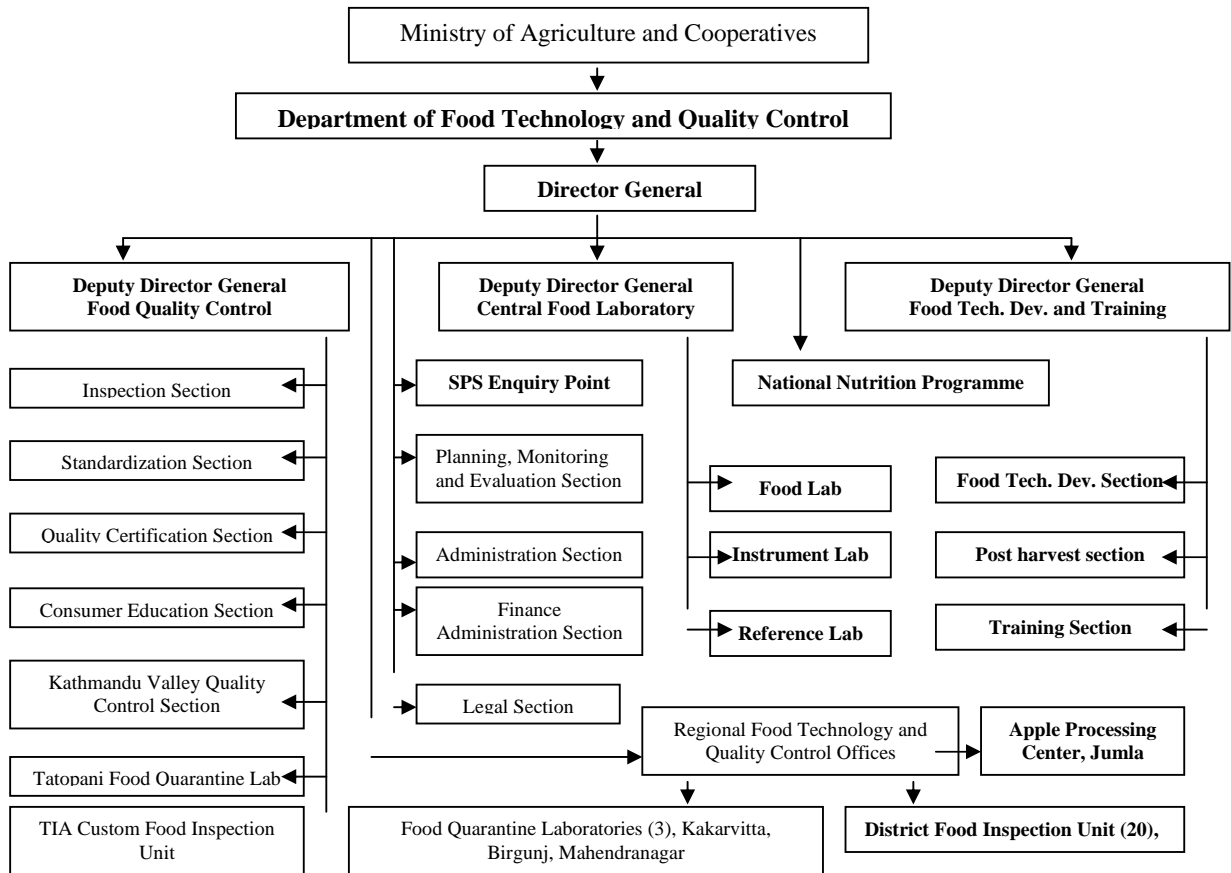
Note: Standard deviations are deviation within the set of data of same lab.

Annex-6: Nutritional Analysis of Foods

S.N.	Name of samples	No. of sample	Parameters analysed																							
			Moisture		Ash		Crude Fiber		Protein		Fat		Iron (mg/100g)		Calcium (mg/100g)		Phosphorus (mg/100g)		Vitamin C (mg/100g)		CHO		Energy			
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
1	Biscuits	19	2.0	6.9	0.6	3.6	0.1	0.4	5.3	10.4	4.1	28.0	0.5	2.0	4.2	45.1										
2	Meat products	11	55.1	71.9	1.8	3.4			12.9	23.1	2.9	18.7	1.0	1.6	3.9	7.6	153.5	346.5								
3	Dry fish	15	8.4	21.9	9.1	16.1			48.8	71.7	4.2	23.5														
4	Cereals	11	8.7	11.8	0.4	3.2	0.2	9.9	5.8	11.7	0.4	7.2	1.5	5.2	3.9	60.4	226.0	577.9								
5	Legumes	10	7.2	9.6	3.2	5.8	1.7	6.2	19.3	32.5	0.9	12.3	3.1	7.0	34.1	54.3	385.0	753.0								
6	Veg Mo:Mo	11	52.9	70.4	1.1	2.4	0.9	1.6	3.4	5.2	0.1	8.7														
7	Paneer Mo:Mo	7	42.7	55.7	1.5	2.6	0.5	1.4	8.9	11.8	4.8	15.8														
8	Buff Mo:Mo	10	48.6	60.8	1.0	2.6	0.2	1.0	9.1	12.7	5.2	10.8														
9	Chicken Mo:Mo	9	45.8	61.2	1.0	2.1	0.2	0.9	7.5	11.1	2.4	13.4														
10	Fresh vegetables	34											0.6	4.8												
11	Akbare khursani	1	85.8		0.9		0.8		3.8		0.6										8.1		53			
12	Khole sag	2	90.5	92.5	1.5		2.1		4.4		0.2		1.0	2.0												
13	Dry mushroom	11	8.3	12.0	4.6	16.3	7.7	36.4	11.8	28.3	6.5	0.4									13.4	62.6	205	320		
14	Sisnu powder	13	8.5	16.8	8.5	20.5	1.6	8.3	8.4	27.5	1.0	4.2	6.2	20.5	79.7	197.8					34.9	62.5	256	311		
15	Lito	7	2.5	3.0	3.1		0.4		21.3	24.9	9.1	14.6	4.3		22.5		419.0		13.7		61.7		430			
16	TomatoJuice	1									0.3		0.3		3.3		21.1		3.3							
17	Aloe vera juice	1													3.6		20.3		4.4							
18	Corn flakes	1	2.2		2.1		1.1		7.4		0.5															
19	Cerelac	1	2.9		2.8		0.1		15.3		2.0		5.0		71.8		411.0				76.8		387			
20	Ari fruits(wild)	1	48.0		2.6		1.1		3.7		0.8								32.4							
21	Son papdi	2	1.8	3.2	0.5	0.8	0.8	0.9	5.9	6.2	24.7	37.0	2.8		18.3						65.8		510			
22	Soup powder	3	1.5	2.3	11.7	12.5	1.4	2.3	9.2	10.1	7.4	9.1									64.0	66.0	368	381		
23	Papad	1	14.3		8.4		2.0		23.8		1.0										50.6		306			
24	Pizza triangle	1	6.5		3.6		0.2		6.2		21.9										61.7		468			
25	Noodles	2	2.8	4.5	3.3	4.2	0.3	0.4	9.7	9.9	19.0	20.5	0.8	0.8	7.5	8.6					62.2	63.2	459	477		
26	Ground apple	1	83.7		0.3		0.1		1.3		0.2		2.0				29.7		4.4		14.4		64			
27	Kurkure	2	4.4	4.8	4.4	4.6	0.3	0.7	6.3	6.3	32.0	48.0									36.4	51.8	520	603		
28	Vermicilli	1	10.4		1.3		0.1		9.9		0.2										78.2		354			
29	Aloo vujiya	1	2.9		2.3		0.1		5.1		50.1										39.6		629			
30	Dalmoth	1	2.5		2.5		0.3		19.9		40.1										34.8		580			
31	Aloo powder	1	12.4		4.6		0.9		5.6		0.2		6.5								76.4		329			
32	Noodles masala	3											16.2	2193												
33	Heerbomax powder	1	4.6		5.8		6.5		2.9		2.1		13.3		62.6		205.0				78.2		343			
34	Herbo pras paste	1	8.7		2.3		4.5		2.3		0.4		11.6		48.8		57.1				81.8		340			
35	Bael fruit	1	59.9		1.7		5.2		8.0		0.1		2.9		26.7		53.3				25.1					
36	Bael sarbat	1	54.5		0.3		ND		1.7		0.1		1.4		8.1		7.6				45.2					
37	Gingelly seed(teel)	1											1.9													

Annex-7: Organization Structure/ Network of DFTQC

Organizational Structure of DFTQC



Organizational Network of DFTQC



- * = Department of Food Technology and Quality Control (1)
- * = Regional Office (Food Technology and Quality Control) (5)
- * = District Level Office
- * = District Food Inspection Unit
- ⌘ = Food Quarantine Laboratory (4)
- ▲ = Food Inspection Unit (Tribhuvan International Airport)