

ANNUAL BULLETIN

2079/80 (2022/23)



Government of Nepal
Ministry of Agriculture and Livestock Development
Department of Food Technology and Quality Control

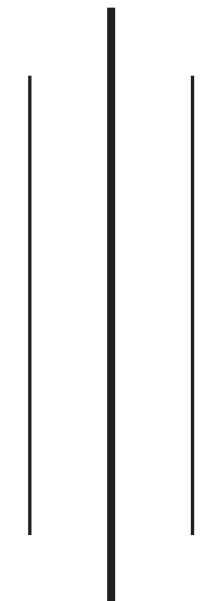
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Preface

With the utmost enthusiasm, Department of Food Technology and Quality Control presents its regular publication, the Annual Bulletin for the fiscal year 2079/80 (2022/23 AD). The Annual Bulletin is a means to disseminate the outcome achieved by the department on ensuring safety and quality of food and feed in Nepal. Food and Feed Safety, a multifaceted sector, demands a wide range of activities; enforcement of Food Act (2023), Regulation (2027), Feed Act (2033), Regulation (2041), Laboratory analysis including pesticide residues, research and development, import/export certification, GAP Certification, dissemination of knowledge, information and skills on food safety, preservation, food based nutrition approaches and other relevant topics. The Annual Bulletin includes all the progress achieved by the department along with all its subsidiary entities (Divisions, Sections and Offices) throughout the fiscal year 2079/80, in a very concise form.

I would like to express my gratitude towards Deputy Director General Mr. Som Kanta Rijal, the Annual Bulletin editorial team, Senior Food Research Officers (Mr. Kishor Khatri, Dr. Huma Bokkhim, Mr. Mohan Krishna Maharjan, Mr. Krishna Prasad Rai, Mr. Bhim Prasad Pulami, Mr. Shivsagar Chaudhary and Dr. Bal Kumari Sharma) and Under Secretary Mr. Yubraj Adhikari for their invaluable inputs and the whole team of Planning and Monitoring Section, Mr. Sanjay Bhandari (SFRO), Ms. Pratima Shrestha (FRO) and Mr. Rajan Sigdel (TA) for diligently working to get the Annual Bulletin published. Lastly, I would like to thank all the staffs of DFTQC and its offices for this earnest efforts to achieve the outcome from their respective position.

I hope this publication will be helpful to all stakeholders who are related to food researches, all consumers, civil societies interested in food safety, quality, technology and nutrition including all other related stakeholders.


.....
Dr. Matina Joshi Vaidya
Director General
Department of Food Technology and Quality Control
Babarmahal, Kathmandu

List of abbreviations

GoN- Government of Nepal

MoALD- Ministry of Agriculture and Livestock Development

DFTQC- Department of Food Technology and Quality Control

NFFRL- National Food and Feed Reference Laboratory

FTDND- Food Technology Development and Nutrition Division

FSSQRD- Food and Feed Safety and Quality Regulation Division

FTQCO- Food Technology and Quality Control Office

FIEQCO- Food Import Export and Quality Certification Office

FTQCDO- Food Technology and Quality Control Division Office

NABL- National Accreditation Board for Testing and Calibration Laboratories

FSSAI- Food Safety and Standards Authority of India

WTO- World Trade Organization

SPS- Sanitary and Phytosanitary

INFOSAN- International Food Safety Authorities Network

RBPR- Rapid Bioassay for Pesticide Residues

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Executive Summary

In the fiscal year 2079/80 B.S. (2022/23 A.D.), Department of Food Technology and Quality Control has accomplished the following targets as per the approved annual program:

- In the fiscal year 2079/80, food/feed market and food/feed industries were inspected 3,348 and 4,230 times respectively. Hotel/Restaurant and sweets shop inspection was conducted 2365 times. Joint monitoring as per the Rapid Response Team Modality including representatives of local authority and other stakeholders was done 746 times. In total, inspection was done 10,689 times throughout the country.*
- In this fiscal year, a total of 3,082 food and feed samples were collected as per the Food and Feed Acts during market inspection across the country from the Food and Feed Safety and Quality Regulation Division under this department, 8 Food Technology and Quality Control Offices and 22 Food Technology and Quality Control Division Offices. Among 2,881 samples analyzed, 198 samples were found to be non-compliant as per mandatory standard, which was 6.87 % of total collected samples.*
- In this year, 121 cases were filed against the business operators at the respective District Administration Offices/District Courts, who had violated the provisions of Food/Feed Acts, regulations and mandatory standards.*
- A total number of 22,742 food/feed samples were analyzed for various purposes at the laboratory facilities within the department and offices under this department.*
- In this fiscal year, altogether 13,460 import permit were issued while 85 were rejected, and a total number of 41,455 samples were analyzed for export/import certification in the 12 Food Import Export Quality Certification Offices located at different custom points. Among them, 58 samples did not meet the conditions for export/import.*
- A total number of 77,605 samples of fresh fruits and vegetables were analyzed for pesticide residues (Organophosphates and organochlorines) using RBPR (Rapid Bio-assay for Pesticide Residue) method among which 50 samples exceeded the permitted enzyme activity inhibition level.*
- A total number of 1,995 licenses of existing food/feed industries were renewed, 827 new licenses were issued and 1,478 industries were recommended for registration.*
- A total number of 319 hotel/restaurants were categorized as per Directive on categorization of hotels / restaurants based on food safety standards (2074). Among them 19 were very good, 52 good, 121 satisfactory and 63 average. Remaining 64 hotels not complying the basic requirements, were instructed for further improvement as per the directive.*
- In this fiscal year, five mandatory standards (food-4, feed – 1; including amendment) were published in nepal Gazette.*
- Physico-chemical analysis of Akabare and Large Cardamom(Alaichi) of different varieties from different region were performed as a baseline study of local foods for food standardization purpose.*

- *Nutritious food recipes based on millet and other locally available raw materials (Poshilo Chukauni, Chayote and soyabody incorporated roti, Millet flour incorporated Aalu Paratha, Millet flour incorporated Pasta and Millet flour incorporated Vegetable Kwati) were developed and studied for school mid day meal program.*
- *Altogether 168 food safety related trainings, interaction and consumer awareness programs covering a wide range of food safety, quality and nutrition topics were conducted. The participants were mostly agro business entrepreneurs, hotel/home stay business operators, street food vendors, consumers, school children, local representative and other related stakeholders.*
- *Skill development training on food processing and preservation was conducted 7 times.*
- *A total number of 433 food and food product samples were analyzed for nutritional composition.*
- *A total of NRs.81504,000 (NRs Eighty one million five hundred four thousand rupees) was collected as non-tax revenue from different services, mainly laboratory testing services, food/feed licensing and food import/export service.*

A. Introduction

Background

Department of Food Technology and Quality Control (DFTQC) is one of the three departments under the Ministry of Agriculture and Livestock Development (MoALD) of Government of Nepal (GoN). It was established in 1961 A.D. as the Department of Food in Singhadurbar, which later in 1965 was shifted to the present location of Babarmahal, Kathmandu. In 1966, the name Department of Food was renamed as Food Research Laboratory. It became Central Food Research Laboratory in 1980. In the year 2000, the Central Food Research Laboratory was given the name “Department of Food Technology and Quality Control (DFTQC)” and became the third department under the then Ministry of Agriculture and Cooperatives. From the very beginning, DFTQC has devoted its 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

Create environment for availability of wholesome, safe and nutritious food to all Nepali citizens and facilitate food trade.

Mission

- Safeguard and protect the health of consumers by assuring the availability of safe and nutritious food with the creation of awareness among producers, traders as well as consumers and facilitate food trade in a coordinated and collaborative approach based on scientific evidence with the updated regulatory framework.
- Promote food businesses by developing appropriate food processing technology through Research and Development (R & D), disseminating, and adopting the outcome of research for the development of food processing enterprises.
- Promote nutritional status of people through the development of food based nutritional approaches.

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
- Promote 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 370 staff (281 Technical and 89 Administrative) including experts having advanced education from local as well as foreign universities in the field of food technology, nutrition, chemistry, botany and other relevant subjects.

Organizational Structure

Under the department, there are currently the following offices.

- Two divisions (Food and Feed Safety and Quality Regulation Division and Food Technology Development and Nutrition Division),
- One National Food and Feed Reference Laboratory,
- One SPS National Enquiry Point,
- One Codex and INFOSAN Secretariat,
- One Planning, Monitoring and Evaluation Section,
- One Administration Section,
- Eight Food Technology and Quality Control Offices (Biratnagar, Janakpur, Hetauda, Pokhara, Bhairahawa, Nepalgunj, Surkhet and Dhangadhi),
- Twelve Food Import Export Quality Certification Offices (Kakarbhitta, Rani, Jaleswar, Birgunj, Tribhuvan International Airport, Belahiya, Krishnanagar, Nepalgunj, Dhangadhi, Mahendranagar, Rasuwa and Tatopani),
- Twenty-two Food Technology and Quality Control Division Offices (Jhapa, Sunsari, Dhankuta, Udayapur, Saptari, Mahottari, Sarlahi, Chitwan, Parsa, Sindhuli, Dhulikhel, Kathmandu, Nuwakot, Tanahun, Kapilvastu, Palpa, Baglung, Dang, Jumla, Baitadi, Doti and Dadeldhura).

The existing structural network of the department is as shown in the Figure.

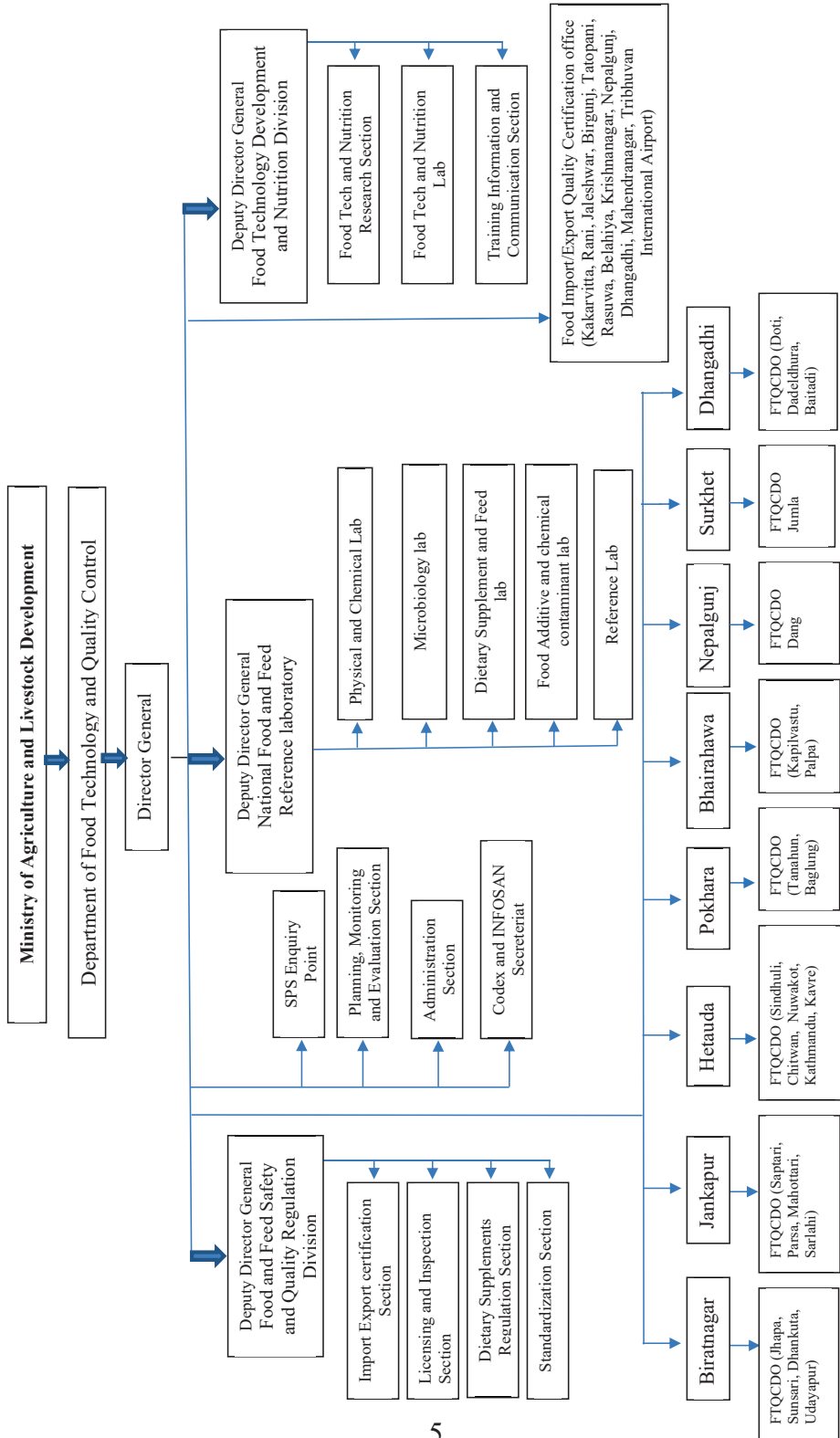


Figure: Organizational structure of Department of Food Technology and Quality Control

B. Annual Progress Report

Fiscal Year 2079/80 (2022/23)

1. Food Quality Control Program

Department of Food Technology and Quality Control has implemented following major programs in this fiscal year as an effort of enforcing food safety and quality control as well as consumer awareness. The main programs were as follows:

1. Food/feed inspection and food/feed sample collection
2. Food/feed industry licensing
3. Development of new food standard and updating the standard
4. Consumer awareness campaign
5. Export/import certification
6. Dietary food supplement regulation

1.1 Market, Industry, Hotel/Restaurants and Sweet Shops Inspection

During this period, Food and Feed Safety and Regulation Division (FSSQRD), eight Food Technology and Quality Control Offices (FTQCOs) and twenty two Food Technology and Quality Control Division Offices (FTQCDOs) inspected food/feed markets, industries, hotel/restaurants and sweets shops. In this fiscal year, food/feed market inspection, industry inspection, hotel / restaurant / sweet shops inspection and rapid response modality inspection in coordination with different carried out 3348, 4230, 2365 and 746 times, respectively throughout the country with the aim to maintain food safety and quality. Details on food/feed market inspection, industry, hotel/restaurants/sweets shops and joint monitoring (rapid response) is shown in the Table 1.1 and Table 1.2.

Table 1.1: Summary of Market, Industry, Hotel/Restaurant/Sweet Shops inspection and Rapid response monitoring.

S.N.	Office	Market Inspection	Industries Inspection	Hotel/ Restaurant Inspection	Rapid Response	Total
1	DFTQC, Kathmandu	90	327	135	40	592
2	FTQCO, Biratnagar	120	236	51	108	515
3	FTQCO, Janakpur	67	221	59	17	364
4	FTQCO, Hetauda	84	277	49	12	422
5	FTQCO, Pokhara	50	237	35	21	343
6	FTQCO, Bhairahawa	60	196	52	21	329
7	FTQCO, Nepalgunj	106	160	50	23	339
8	FTQCO, Surkhet	91	158	61	16	326
9	FTQCO, Dhangadhi	159	321	144	31	655
10	22 FTQCDOs	2521	2097	1729	457	6804
	Total	3348	4230	2365	746	10689

Table 1.2: Market, Industry, Hotel/Restaurant/ Sweet Shops inspection and Rapid response monitoring conducted by division offices.

S.N.	Office	Market Inspection	Industry Inspection	Hotel/ Restaurant Inspection	Rapid Response	Total
1	FTQCDO, Jhapa	159	304	119	94	676
2	FTQCDO, Sunsari	130	166	95	56	447
3	FTQCDO, Dhankuta	112	97	100	14	323
4	FTQCDO, Udayapur	167	72	59	17	315
5	FTQCDO, Saptari	112	80	82	14	288
6	FTQCDO, Mahottari	108	49	39	14	210
7	FTQCDO, Sarlahi	48	27	22	13	110
8	FTQCDO, Parsa	83	117	64	14	278
9	FTQCDO, Chitwan	117	80	60	16	273
10	FTQCDO, Sindhuli	149	65	133	8	355
11	FTQCDO, Kavre	78	96	50	12	236
12	FTQCDO, Kathmandu	135	92	98	38	363
13	FTQCDO, Nuwakot	104	62	80	12	258
14	FTQCDO, Tanahun	88	205	169	15	477
15	FTQCDO, Baglung	93	52	50	12	207
16	FTQCDO, Palpa	220	93	180	20	513
17	FTQCDO, Kapilbastu	175	136	69	18	398
18	FTQCDO, Dang	101	145	50	16	312
19	FTQCDO, Jumla	70	23	34	9	136
20	FTQCDO, Doti	100	74	81	13	268
21	FTQCDO, Baitadi	91	14	45	15	165
22	FTQCDO, Dadeldhura	81	48	50	17	196
	Total	2521	2097	1729	457	6804

1.1.1 Industry Inspection

Altogether 4230 food and feed industries were inspected in this period focusing on:

- Industry licensing and renewing
- Product packaging and labeling
- Premises and surrounding environment of industry

- Processing technology and processing flow chart
- Production plant condition
- Ingredients and additives used
- Storage condition of raw and finished products
- Good Manufacturing Practices and Good Hygienic Practices

Necessary suggestion for improvement in safety and quality product was given to owner and technical personnel. Figure 1.1 shows the industry inspection carried out for past 10 fiscal years.

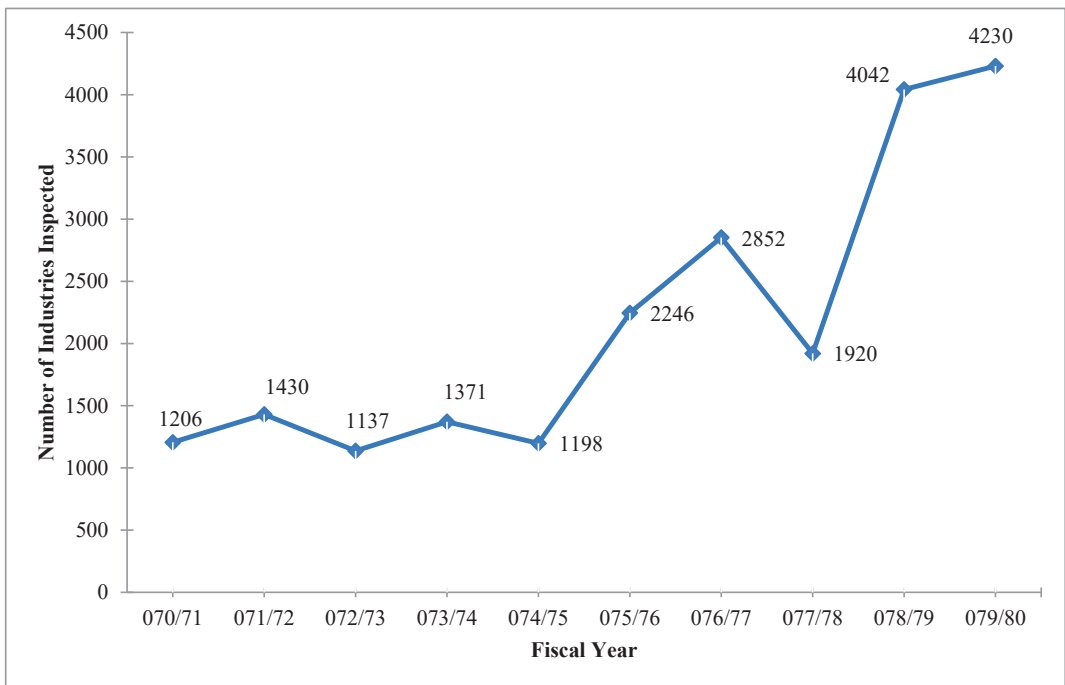


Figure 1.1: Number of Industries Inspected for the Past Ten Fiscal Years (070/71-079/80).

From the above figure, it can be observed that the number of industries inspected were nearly similar from fiscal year 2070/71 to fiscal year 2074/75. After the establishment of division offices in the year 2075, the number increased gradually. However, in the fiscal year 2077/78, the decrease in the number was observed and it can be due to the impact of Covid-19 pandemic. In contrast, in the following fiscal year 2078/79 and 2079/80, there was substantial increase in number due to reopening of industries after the settlement of pandemic.

1.1.2 Hotel/Restaurant and Sweets Shop Inspection

In this fiscal year 2079/80, different hotel/restaurants and sweet shops were inspected 2365 times throughout the country. Figure 1.2 shows the number of hotels / restaurants / sweet shops inspection conducted by FFSQRD, FTQCOs and FTQCDOs for the past 10 fiscal years.

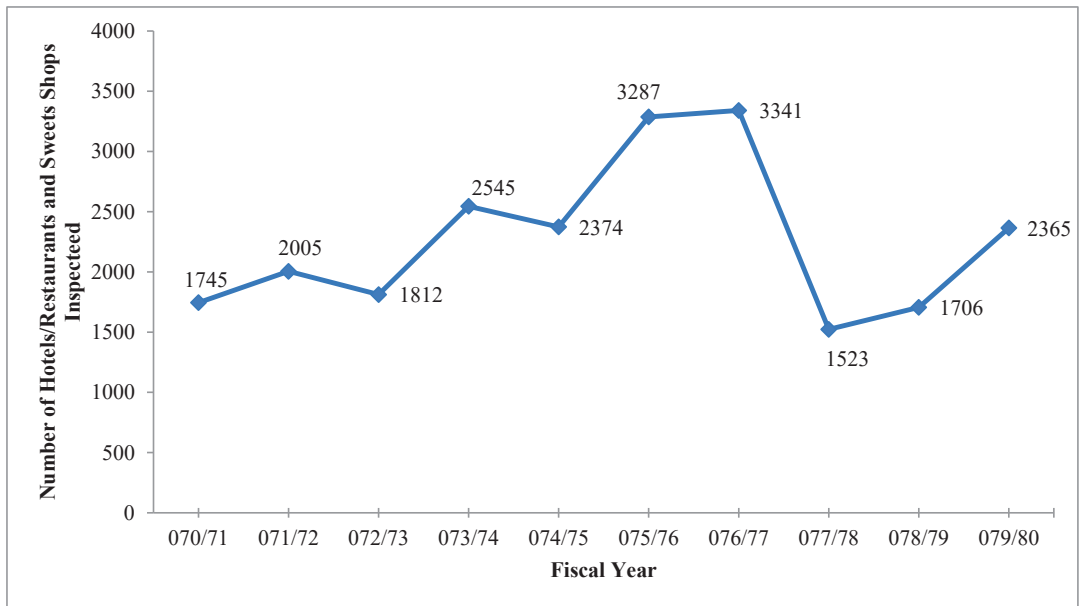


Figure 1.2: Number of Hotel/Restaurants and Sweet Shops Inspected for Past Ten Fiscal Years.

Figure 1.2 shows that the number of hotels/ restaurants and sweets shop inspected increased drastically in fiscal year 2073/74 compared to previous years. Nevertheless, the number then decreased slightly in fiscal year 2074/75 but again increased until fiscal year 2076/77. This is due to the priority given to hotels/restaurants inspection in the 14th periodic plan. Due to the Covid-19 pandemic and subsequent lockdown, there was a massive decrease in the number of hotel restaurants inspected. However, from the fiscal year 2078/79, the hotel restaurant inspection slightly increased as compared to the previous fiscal year. This slight increase was observed after the settlement of Covid-19 pandemic.

1.2 Sample collection (As per food/feed act and surveillance)

During this fiscal year, FFSQRD, eight FTQCOs and twenty-two FTQCDOs collected 2830 food and 252 feed samples with total 3082 samples under the Food/Feed Act. In this fiscal year, total 2495 surveillance samples were collected. Summary of the food/feed samples collected by various offices are reflected in the Table 1.3 and 1.4.

Table1.3: Summary of Sample Collection (as per Food/Feed act and Surveillance)

S.N.	Office	Number of samples as per act			Surveillance
		Food	Feed	Total	
1	FFSQRD, DFTQC	92	4	96	177
2	FTQCO, Biratnagar	102	16	118	100
3	FTQCO, Janankpur	106	21	127	153
4	FTQCO, Hetauda	109	8	117	106
5	FTQCO, Pokhara	80	10	90	202
6	FTQCO, Bhairahawa	105	10	115	186

7	FTQCO, Nepalgunj	100	18	118	168
8	FTQCO Surkhet	119	11	130	155
9	FTQCO, Dhangadhi	87	17	104	146
10	22 FTQCDOs	1930	137	2067	1102
	Total	2830	252	3082	2495

Table 1.4: Summary of Sample Collection (as per food/feed act and surveillance) by Division Offices.

S.N.	Office	Number of samples as per act			Number of Surveillance Sample
		Food	Feed	Total	
1	FTQCDO, Jhapa	77	10	87	58
2	FTQCDO, Sunsari	103	6	109	72
3	FTQCDO, Dhankuta	78	5	83	33
4	FTQCDO, Udayapur	100	8	108	27
5	FTQCDO, Saptari	101	10	111	45
6	FTQCDO, Mahottari	103	8	111	38
7	FTQCDO, Sarlahi	39	0	39	65
8	FTQCDO, Parsa	108	17	125	63
9	FTQCDO, Bharatpur	100	28	128	36
10	FTQCDO, Sindhuli	58	0	58	32
11	FTQCDO, Dhulikhel	100	3	103	15
12	FTQCDO, Kathmandu	101	2	103	191
13	FTQCDO, Nuwakot	108	6	114	29
14	FTQCDO, Tanahun	107	6	113	41
15	FTQCDO, Baglung	100	10	110	60
16	FTQCDO, Palpa	90	7	97	60
17	FTQCDO, Kapilbastu	55	0	55	22
18	FTQCDO, Dang	100	11	111	43
19	FTQCDO, Jumla	80	0	80	25
20	FTQCDO, Doti	100	0	100	51
21	FTQCDO, Baitadi	100	0	100	65
22	FTQCDO, Dadeldhura	22	0	22	31
	Total	1930	137	2067	1102

Figure 1.3 shows the number of food and feed samples (as per act) collected throughout the country for the past five fiscal years. The number of formal food samples collected increased in fiscal year 2076/77 compared to the fiscal year 2075/76. In contrast, there was decrease in the number of formal samples collected in the fiscal year 2077/78 compared to previous two fiscal years. This was due to the effect of Covid-19 pandemic. The number of collected formal samples increased rapidly in the fiscal year 2078/79 due to the settlement of Covid-19 pandemic since the risk of Covid-19 reduced. However, the number of collected sample reduced in the fiscal year 2079/80 due to interruption and huge cut off of government budget.

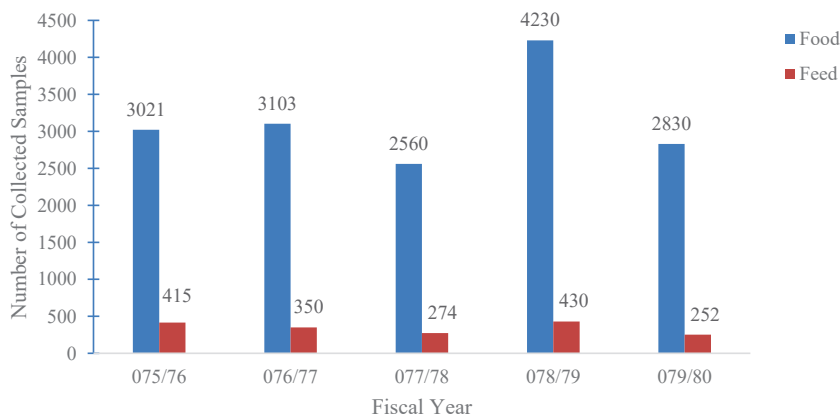


Figure 1.3: Food and Feed Sample Collection (as per Food/Feed act) of past five fiscal years

During the fiscal year 2079/80, laboratory analysis of formal food and feed sample was conducted by National Food and Feed Reference Laboratory (NFFRL) and six FTQCOs. Newly upgraded FTQCO, Pokhara and Surkhet completed the laboratory establishment process and started sample analysis but formal samples were not analyzed in these offices. In total, NFFRL and six FTQCOs analyzed 2881 formal food and feed samples, 198 samples were non-compliant out of them (6.87%). Altogether, 121 cases were filed by different offices under the department during this period. Table 1.5 shows the number of samples analyzed, number of non-compliant samples and the number of cases filed under different food category. Table 1.6 shows the number of cases filed by different offices during fiscal year 2079/80. Highest number of cases were filed by FTQCDO, Kathmandu in this period. Most of the cases filed belonged to the category of processed drinking water followed by milk/milk products and cereals, legumes and their products.

Table 1.5: Number of sample analyzed as per act and cases filed during the fiscal year 2079/80.

S.N.	Food Groups	Samples Analyzed	Number of non-compliance samples	Cases filed*
1	Milk and Milk Products	116	21	17
2	Fats and Oils	349	15	0
3	Fruits and Vegetable Products	351	25	7
4	Spices	283	7	7
5	Tea and coffee	127	4	7
6	Salt	53	1	0
7	Cereals, legumes and their products	910	47	16
8	Processed Drinking Water	155	41	21
9	Sweetening Agents	82	14	5
10	Sweets and Confectionery	94	2	0
11	Meat and meat products	42	2	0
12	Feed	217	13	15
13	Other food products	125	6	26
Total		2881	198	121

Note: * Case filed from previous year's non –compliant samples also included.

Table 1.6: No. of Cases Filed by Offices

S.N.	Office	No. of case filed
1	DFTQC, Kathmandu	11
2	FTQCO, Biratnagar	10
3	FTQCO, Janakpur	1
4	FTQCO, Hetauda	5
5	FTQCO, Pokhara	7
6	FTQCO, Bhairahawa	10
7	FTQCO, Nepalgunj	4
8	FTQCO, Surkhet	1
9	FTQCO, Dhangadhi	5
10	FTQCDO, Jhapa	14
11	FTQCDO, Sunsari	5
12	FTQCDO, Dhankuta	0
13	FTQCDO, Udayapur	3
14	FTQCDO, Saptari	2
15	FTQCDO, Mahottari	0
16	FTQCDO, Sarlahi	2
17	FTQCDO, Parsa	3
18	FTQCDO, Chitwan	2
19	FTQCDO, Sindhuli	2
20	FTQCDO, Dhulikhel	0
21	FTQCDO, Nuwakot	1
22	FTQCDO, Kathmandu	17
23	FTQCDO, Tanahun	11
24	FTQCDO, Baglung	0
25	FTQCDO, Kapilbastu	0
26	FTQCDO, Palpa	5
27	FTQCDO, Dang	0
28	FTQCDO, Jumla	0
29	FTQCDO, Baitadi	0
30	FTQCDO, Doti	0
31	FTQCDO, Dadeldhura	0
	Total	121

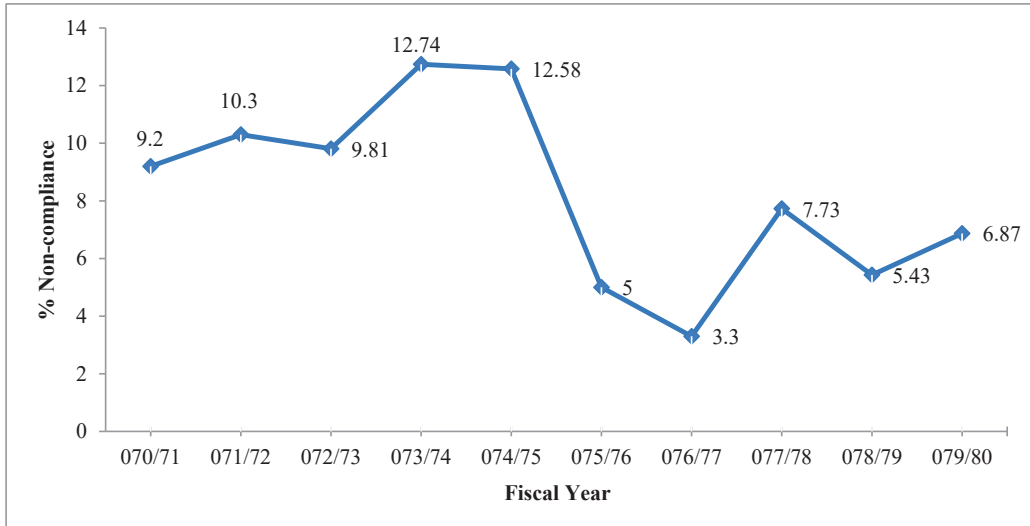


Figure 1.4: Percentage Non- compliance of Food/Feed Samples for the Past Ten Fiscal Years.

Figure 1.4 presents the percentage of non-compliance in food and feed samples since 10 fiscal years. From above figure, there was improvement with a consistent decline in percentage of non-compliant samples. The decrease in percentage of non-compliant samples may be due to establishment of division of in fiscal year 2075/76, regular market inspection, inspection via rapid response modality and food safetyawareness programs organized by DFTQC.

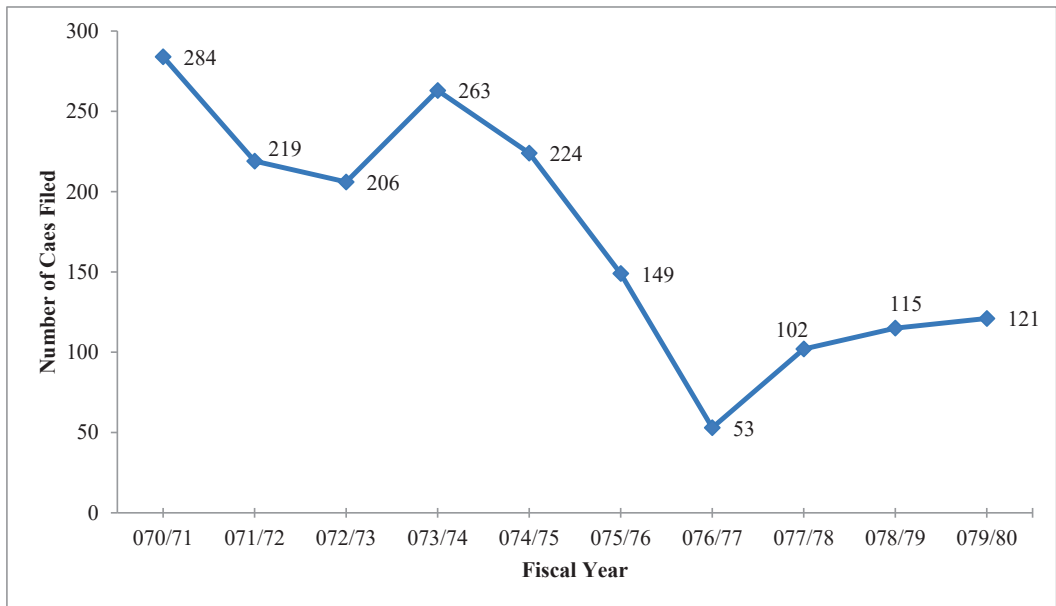


Figure 1.5: Cases Filed for Past Ten Fiscal Years.

Figure 1.5 presents the number of cases filed over the past 10 years. The cases were filed at the district administrative office and district court to those violating the Food /Feed Act and Food/Feed regulations. From above figure, the number of cases filed increased since fiscal year 076/77 to 079/80 due to prioritization of action against non-compliant sample. In this fiscal year 2079/80, 44 and 37 cases were filed against adulterated and substandard samples, respectively 14 and 26 were against label and acts and regulations, respectively.

1.3 Food and Feed Industry Licensing

It is mandatory for all food/feed industries to get license issued from DFTQC as per Food and Feed Act. The issued license needs to be renewed annually. Altogether, 827 new licenses were issued, 1995 licenses were renewed whereas 1478 new industries have been recommended during this fiscal year. Table 1.7 shows the details on the status of licensing and recommendation of food /feed industries throughout the country in this fiscal year.

aTable 1.7: Summary of Licensing and Recommendation of Food/Feed Industries.

S.N.	Office	New License Issued (No.)	License Renewal (No.)	Industry Recommendation (No.)	Total (No.)
1	DFTQC, Kathmandu	156	518	423	1097
2	FTQCO, Biratnagar	200	454	242	896
3	FTQCO, Janakpur	82	321	276	679
4	FTQCO, Hetauda	94	145	89	328
5	FTQCO, Pokhara	119	132	116	367
6	FTQCO, Bhairahawa	62	117	130	309
7	FTQCO, Nepalgunj	33	103	78	214
8	FTQCO, Surkhet	34	42	30	106
9	FTQCO, Dhangadhi	47	163	94	304
	Total	827	1995	1478	4300

The food/feed industry licensing (new issue and renewal) for past 10 fiscal years is shown in Figure 1.6.

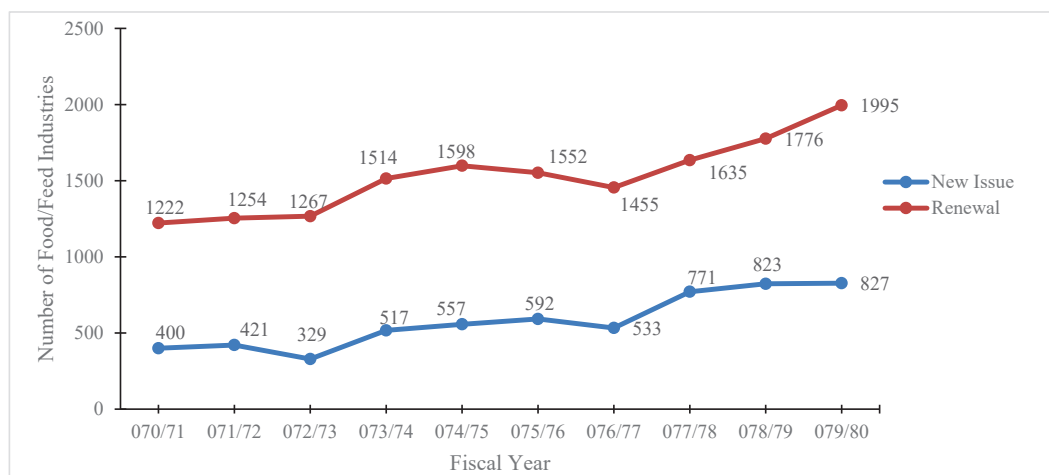


Figure 1.6: Food/Feed Industry Licensing (New Issue and Renewal) for Past Ten Years.

The number of industries getting new license and renewal is increasing. This could be due to active inspection, continuous consultancy services and increased awareness of agro-business operators about the provision of food/feed industry licensing according to Food and Feed Act. Summary of issuance of new license, renewal and recommendation given to different category of food products is shown in Table 1.8.

Table 1.8: Summary of Issuance of New License, Renewal and Recommendation.

S.N.	Category	New Issue	Renewal	Recommendation	Total
1	Milk and Milk Products	69	127	191	387
2	Fats and Oils	26	105	25	156
3	Fruits and Vegetable Products	76	101	143	320
4	Spices	69	169	144	382
5	Tea and coffee	51	119	73	243
6	Salt	0	1	0	1
7	Cereals, legumes and their products	353	853	643	1849
8	Processed Drinking Water	57	229	71	357
9	Sweetening Agents	19	42	42	103
10	Sweets and Confectionery	4	23	18	45
11	Meat and meat products	24	39	52	115
12	Feed	17	58	6	81
13	Other food products	62	129	70	261
Total		827	1995	1478	4300

1.4 Food Export/Import Permit and Certification

It is mandatory to get permission from DFTQC before importing food products to Nepal as a part of pre-border food quality control. FSSQRD provides import permit to those willing to import food products in Nepal. To get import permit; importers need to provide the necessary documents regarding safety of the food products along with the application. After getting import permit, the importers can import their products from custom points within the validity period of permit. From the custom points, sample of the products are sent to FIEQCO for laboratory analysis and approval for entry as a part of border food quality control. Food products fit for entry are imported whereas those failing the criteria are either destroyed or sent back to exporting country.

In this fiscal year, FSSQRD issued 13,460 food import permits while 85 food import permit request were rejected as they did not meet the import criteria. A total of 41,455 samples were analyzed for export/import certification from twelve FIEQCOs located at different custom points of Nepal. The number of samples analyzed for food import/export certification by different FIEQCOs is shown in Table 1.9.

Table 1.9: Samples Analyzed for Import/Export Certification.

S.N.	Office	Number of Samples	Rejection
1	FIEQCO, Kakarvitta	790	0
2	FIEQCO, Rani	5021	3
3	FIEQCO, Jaleshwar	1582	1
4	FIEQCO, Birgunj	10968	35
5	FIEQCO, Tatopani	51	0
6	FIEQCO, Rasuwa	333	0
7	FIEQCO, Belahiya	11956	9
8	FIEQCO, Krishnanagar	1658	0
9	FIEQCO, Nepalganj	4799	4
10	FIEQCO, Dhangadhi	3514	6
11	FIEQCO, Mahendranagar	413	0
12	FIEQCO, TIA	370	0
	Total	41455	58

1.5 Rapid Bioassay for Pesticide Residue (RBPR)

Pesticide residue analysis of imported fresh fruits and vegetables at different custom point was started in the fiscal year 2078/79 as directed by Ministry of Agriculture and Livestock Development. Initially, the responsibility was assigned to four FIEQCO (Kakarvitta, Rani, Jaleshwar and Birgunj) and three FTQCO (Bhairahawa, Nepalgunj and Dhangadhi). However, in the fiscal year 2079/80, this facility was provided by all 12 FIEQCOs. For the first few months, FTQCO Bhairahawa, Nepalgunj and Dhangadhi

also analyzed fruits and vegetables for pesticide residue by RBPR method. Samples regarding such tests were not received at FIEQCO Tatopani and Rasuwa.

A total number of 77,605 samples of fresh fruits and vegetables were analyzed for testing pesticide residues (Organophosphates and Organochlorines) using RBPR method, out of which, 50 samples were found substandard. Table 1.10 shows the number of imported fresh fruits and vegetables samples analyzed by different offices for pesticide residue in this fiscal year.

Table 1.10: Number of Fresh Fruits and Vegetable Samples Analysed for Pesticide Residue by RBPR Method.

S.N.	Office	Number of Samples	Rejection
1	FIEQCO, Kakarvitta	10810	11
2	FIEQCO, Rani	4216	0
3	FIEQCO, Jaleswar	4960	0
4	FIEQCO, Birgunj	473	2
5	FIEQCO, Tatopani	0	0
6	FIEQCO, Rasuwa	0	0
7	FIEQCO, Belahiya	14637	11
8	FIEQCO, Krishnanagar	13063	13
9	FIEQCO, Nepalganj	12952	5
10	FIEQCO, Dhangadhi	3726	0
11	FIEQCO, Mahendranagar	2646	3
12	FIEQCO, TIA	146	0
13	FTQCO, Bhairahawa	9663	5
14	FTQCO, Nepalgunj	233	0
15	FTQCO, Dhangadhi	80	0
	Total	77,605	50

1.6 Hotels/Restaurants Inspection and Categorization

In this fiscal year, 319 hotels and restaurants were inspected for categorization as per Directives on Categorization of Hotels/Restaurants Based on Food Safety (2074). Inspected hotel/restaurants were provided different stickers according to their grades based on food safety criteria as shown in Figure 1.7. Among the hotels inspected for categorization, 19 were categorized as very good, 52 as good, 121 as satisfactory and 63 as average. Remaining 64 hotels/restaurants below average were instructed for further improvement.

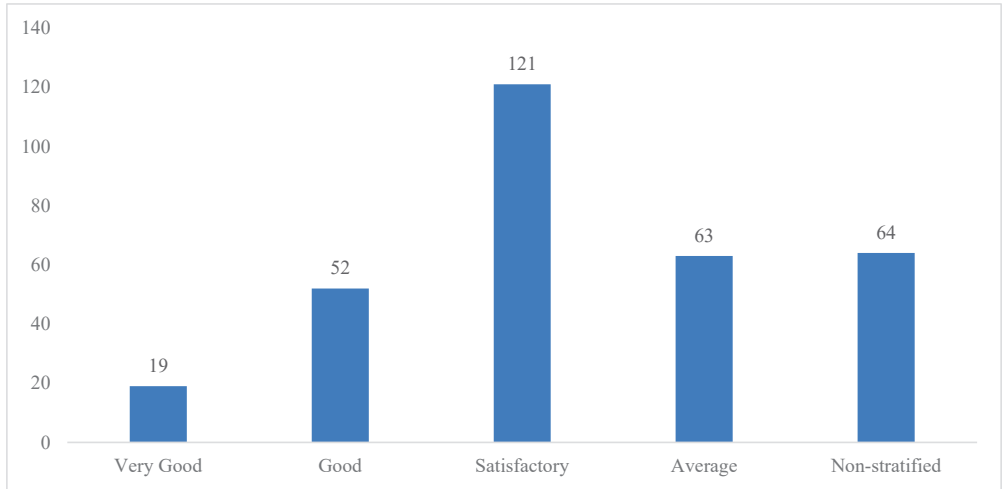


Figure 1.7: Hotel/Restaurant categorization.

1.7 Dietary Supplement Registration and Renewal

Dietary supplement registration and renewal of registered product are conducted by FFSQRD as a part of dietary supplement regulation. In this fiscal year, 1235 dietary supplements were registered whereas 1515 were renewed as per the Guidelines on regulation of dietary supplements. Figure 1.8 shows dietary supplement registration and renewal for past five years.

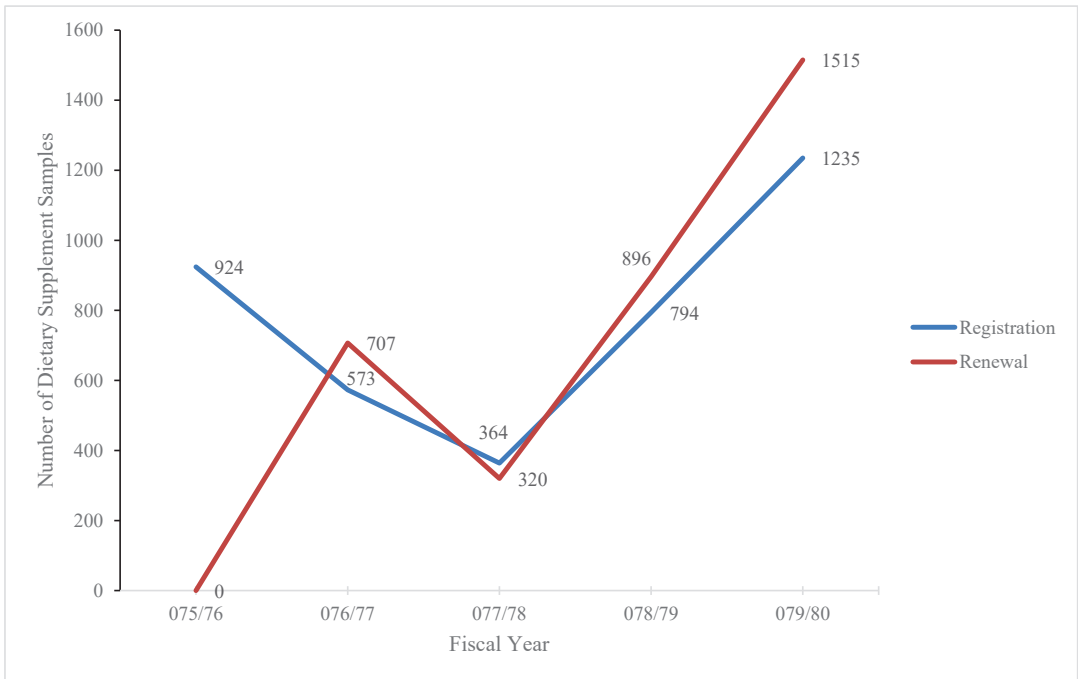


Figure 1.8: Dietary Supplement Registration and Renewal for Past Five Years.

1.8 Food and Feed Standardization

Mandatory standards (including amendment) of food and feed products published in Nepal Gazette are as follows:

- Cereal Based Complementary Foods for Infants and Young Children
- Maximum level of Heavy metals in Food
- Maximum residue limit of Pesticide in fruits and vegetables
- Fortified Rice
- Poultry (Layers and Broiler) Feed

Standards approved by Food Standard Fixation Committee are as follows:

- Maximum level of Industrial Trans Fat in food
- Prohibition of use of printed paper in direct contact with food
- Rolled Oats

1.9 Food Safety and Quality Awareness Programs

In the fiscal year 2079/80, following interaction programs related to awareness on food safety, hygiene and quality assurance were conducted by Department of Food Technology and Quality Control:

- Food safety and quality interaction programs were conducted 32 times at different places (5 times with food business operators and 27 times with hotel homestay business operators) and at 45 places with local level representatives.
- Awareness programs related to food safety, hygiene and nutrition were conducted at 44 different schools.
- Awareness programs related to food safety and hygiene were performed at 18 different places in order to improve the quality and hygiene of food items sold in street.
- Consumer awareness programs regarding food safety and hygiene were held 29 times throughout the country.

2. Laboratory Analysis of Food/Feed

2.1 Analysis of Food/Feed

National Food and Feed Reference Laboratory (NFFRL) and food laboratories at FTQCOs perform analysis of food/feed for various purposes such as:

- 1) Compliance of Food and Feed Act/Regulation
- 2) Standardization
- 3) Licensing (Issue and renewal)
- 4) Certification
- 5) Requested and complaint samples
- 6) Others

Laboratory analysis conducted by different offices is shown in the Table 2.1.

Table 2.1: Summary of Laboratory Analysis by different offices.

S.N.	Office	Food	Feed	Total
1	DFTQC, Kathmandu	4501	195	4696
2	FTQCO, Biratnagar	4259	172	4431
3	FTQCO, Janakpur	4200	100	4300
4	FTQCO, Hetauda	2329	152	2481
5	FTQCO, Pokhara	1400	13	1413
6	FTQCO, Bhairahawa	1510	60	1570
7	FTQCO, Nepalgunj	1591	95	1686
8	FTQCO, Surkhet	500	11	511
9	FTQCO, Dhangadhi	1605	49	1654
	Total	21,895	847	22,742

In the fiscal year 2079/80, laboratory analysis services were provided by NFFRL and eight FTQCOs. A total of 22,742 samples received as formal, surveillance, licensing, requested and other purpose were analyzed for different parameters. Table 2.2 shows the summary of sample analyzed by different offices for different purpose.

Table 2.2: Sample Analysis for Different Purpose.

Sample/ Office	Formal Sample		Surveillance sample		Licensing Sample		Requested Sample		Others	
	Analyzed sample	Non - compliance	Analyzed sample	Non - compliance	Analyzed sample	Non - compliance	Analyzed sample	Non - compliance	Analyzed sample	Non - compliance
NFFRL, Kathmandu	850	64	467	19	2126	83	985	99	268	4
FTQCO, Biratnagar	501	37	289	16	2069	104	1381	5	191	0
FTQCO, Janakpur	414	37	290	15	1849	105	1747	101	0	0
FTQCO, Hetauda	269	19	83	11	2055	81	74	2	0	0
FTQCO, Pokhara	0	0	258	54	1155	41	0	0	0	0
FTQCO, Bhairahawa	265	21	268	38	783	44	254	13	0	0
FTQCO, Nepalgunj	256	5	204	4	830	35	396	4	0	0
FTQCO, Surkhet	0	0	154	34	343	32	14	0	0	0
FTQCO, Dhangadhi	326	17	295	36	914	77	117	10	2	0
Total	2881	159	2308	208	12124	525	4968	223	459	4

The food and feed sample analyzed by laboratories under DFTQC (except import/export certification) for last six years is shown in the Figure 2.1.

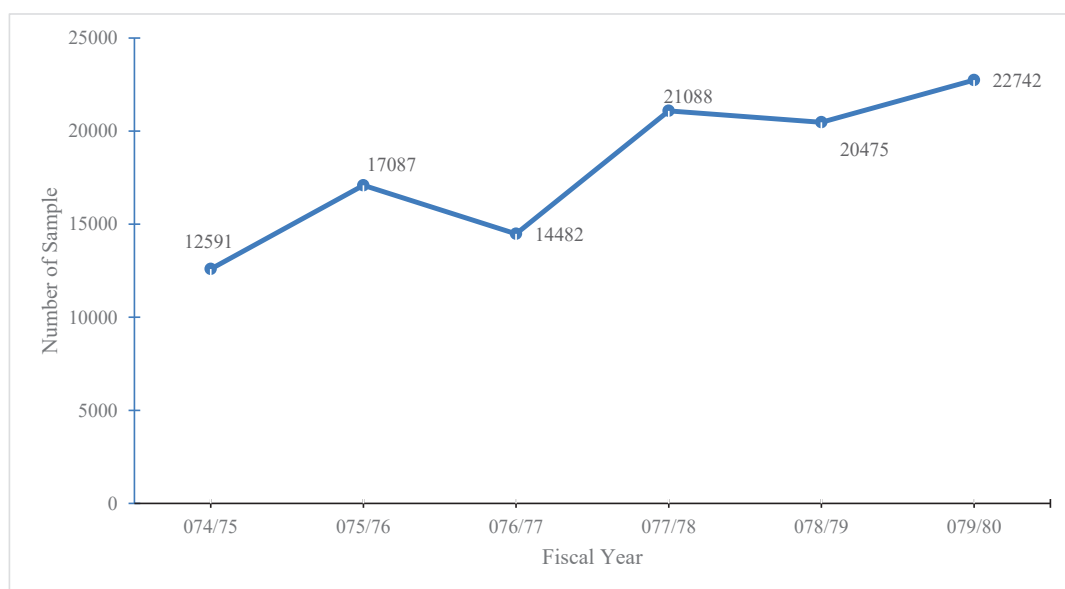


Figure 2.1: Laboratory Analysis for Past Six Years.

Figure shows that the number of sample analyzed by laboratories is increasing. This could be due to active inspection, increasing number of industries, increased awareness of agro-business operators about the provisions in Food and Feed Act.

2.2 Laboratory Analysis service for Export Promotion

National Food and Feed Reference Laboratory has been providing the laboratory analysis service for export promotion. In fiscal year 2079/80, 146 samples were analyzed for this purpose. Table 2.3 shows the summary of sample analyzed for trade promotion.

Table 2.3: Sample Analyzed for Trade Promotion.

S.N.	Analyzed food commodities	Number of Sample	Export to
1	Milk products (esp. <i>Chhurpi</i>)	87	USA, Australia, Thailand, UK
2	Fruits and Vegetables & its products	30	USA, Japan
3	Spices and condiments (Large cardamom)	2	USA
4	Honey	10	Japan
5	Tea and Coffee	17	Japan
Total Sample		146	

*Information provided by exporter

2.3 Progress on Laboratory Accreditation

In the fiscal year 2079/80, NFFRL was accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL), India as per ISO/IEC 17025:2017 and the accreditation scope was extended to 286 parameters (245 chemical and 41 microbiological). Moreover, laboratory of Food Technology and Quality Control Office, Biratnagar was also accredited by NABL for 7 commodities which includes 23 chemical parameters. Details on certificate of accreditation and scope of accreditation of NFFRL (chemical and microbiological) and FTQCO, Biratnagar is given in Annex 1.

3. Food Technology Development and Nutrition program

The approved programs for Food Technology Development and Nutrition Division (FTDND) for the fiscal year 2079/80 were:

- 1) Training on Food Processing Technology
- 2) Training on Food safety and Nutrition
- 3) Nutrient content analysis of different foods and food products
- 4) Method verification of nutrient analysis in foods
- 5) Profiling of traditional and ethnic foods of Nepal
- 6) Texture profile analysis of *Newari* food using texture meter
- 7) Recipe development for school mid-day meal program
- 8) Baseline study of different local/traditional foods for food standardization purpose

3.1 Training on Food Processing Technology

Food Technology Development and Nutrition Division (FTDND) and Food Technology and Quality Control Offices (FTQCOs) conducted food processing trainings in order to promote small and medium scale food businesses at federal and provincial levels respectively.

Training of Trainers was conducted by FTDND for the staffs of different FTQCOs. Theoretical knowledge on food laws and regulations, food additives, food processing, labelling and packaging, food licensing and good manufacturing practices were covered in the training. Hands on practical knowledge on processing of different food products were also conducted. Food processing trainings conducted by different offices is given in Table 3.1.

Table 3.1 Food processing trainings conducted by different offices.

S.No.	Name of the office	Topic of training	Date of training	Female	Male	Total
1.	FTDND, DFTQC	Food processing technology	2079/07/20 to 2079/07/30	17	8	25
2.	FTDND, DFTQC	Food processing technology	2079/10/17 to 2079/10/27	13	8	21
3.	FTDND, DFTQC	Training of trainers	2079/09/11 to 2079/09/14	7	13	20
4.	FTQCO, Hetauda	Food processing technology	2079/08/25 to 2079/08/29	17	1	18
5.	FTQCO, Pokhara	Food processing technology	2079/10/03 to 2079/10/06	25	14	39
6.	FTQCO, Bhairahawa	Food processing technology	2079/10/05 to 2079/10/10	17	4	21
7.	FTQCO, Surkhet	Food processing technology	2079/11/03 to 2079/11/05	14	10	24
Total participants				110	58	168

3.2 Training on Food Safety and Nutrition

A four day Food safety and nutrition training was conducted by FTDND in this fiscal year. Seventeen staffs, (3 female; 14 male) from small/cottage industries producing food products such as Bakery, Chips and *Sattu* participated in the training. A total of 12 theoretical classes encompassing different pre-requisites for small/cottage industries to ensure the production of safe and nutritious foods.

3.3 Nutrient Content Analysis of Various Food and Food Products

Altogether 433 different food and food products were analyzed for their proximate nutrient content in the food technology development and nutrition laboratory. Table 3.2 shows the categories of food products analyzed.

Table 3.2 Number of food products analyzed

S.N.	Food categories	No. of sample
1.	Cereals and cereal products (including bakery, snack foods)	157
2.	Pulses and legumes	5
3	Green and dry leafy vegetables	1
4	Condiments and spices	7
5	Traditional foods (<i>Masyaura</i> , <i>Gundruk</i> , Newari & Limbu dishes etc.)	33
6	Milk and milk products	7
7	Miscellaneous foods (coffee, yam, pickles, honey etc.)	21
8	Samples for R&D, export, nutritional labelling	202
	Total	433

3.4 Method Verification of Nutrient Analysis in foods

Phosphorous, a naturally occurring component, is an important element in human diet. Phosphates are used as food additives in products such as cheese, meat etc. The principle underlying the determination of phosphorous is that ammonium molybdate reacts under acid conditions to form the heteropoly acid, molybdophosphoric acid. In the presence of vanadium, yellow vanadomolybdo-phosphoric acid is formed. The intensity of the yellow color is proportional to phosphate concentration. Absorbance can be measured at 400, 420 or 470 nm depending on the required sensitivity,, as the absorbance at 400 nm is ten times higher than at 490 nm for a given phosphorous concentration. Different samples of vegetables, fruits, cereals and pulses were collected from different parts of Nepal and were analyzed for phosphorous content. The absorbance of both samples and standard of phosphorous were measured at 400nm in UV-Vis spectrophotometer. The concentration of phosphorous was calculated using the calibration curve of phosphorous. For linearity, Certified Reference Material (CRM) from Agilent technologies was used. The standard calibration curve of phosphorous having R^2 value of 0.9997 was achieved, which indicated good linearity. The Limit of Detection (LOD) [$3(SEb/slope)$] was found to be 0.2026 ppm. The Limit of Quantification (LOQ), $2*LOD$, was estimated to be 0.405 ppm. The phosphorous content in different food samples are shown in Figure 3.1.

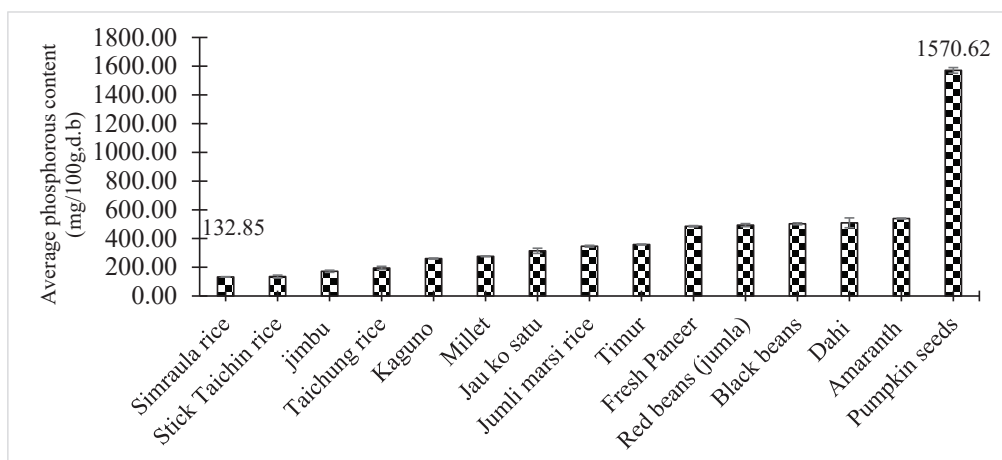


Figure 3.1: Average phosphorous content in different food samples.

3.5 Profiling of Traditional and Ethnic Foods of Nepal

3.5.1 Profiling of Ethnic Foods of Nepal (Newari Cuisines)

There are 126 ethnic groups in Nepal. Newars accounts 5% (1,321,933) of the total population and they are the indigenous people of Kathmandu valley. Newari food culture is characterized by exotic cooking involved to produce different Newari cuisines. Meat based samples of ethnic Newari cuisines (*chhoyela*, *Kachela*, *sapumicha*, *Bhutan*, *jibro*, *gidi*, *fokso-fried*, *sukuti*, *sekuwa* etc.) were collected from the local market and their proximate nutrient contents were analyzed. The results are shown in Table 3.3. *Sapumhicha-2* (Honacha), scored the highest calorific value i.e 851.53 KCal/100g, which can be because of high crude fat content (90.64%, d.b.). Lean buff meat (raw), scored the lowest calorific value (388.54 KCal/100g) followed by the lowest crude fat (2.0% d.b.). In the other hand, the highest crude protein content was observed in lean raw buff meat (90.96, % d.b.) while the lowest was observed in *Sapumhicha-1* (7.91%, d.b.).

Table 3.3: *Proximate Nutrient contents of different Newari cuisines.

Name of the sample	Moisture (%)	Total ash (%)	Crude Fat (%)	Crude Protein (%)	Crude fiber (%)	Carbohydrate (%)	Energy (Kcal/100g)
<i>Chicken Chhoyela</i>	62.42	2.50	12.04	19.89	1.05	2.10	196.31
<i>Buff Chhoyela</i>	55.24	1.87	14.27	20.89	0.53	7.20	240.80
<i>Kha- Go:</i>	61.42	0.95	10.27	24.91	0.47	1.99	200.01
<i>Kha-Go: 1</i>	35.01	1.92	19.53	43.26	0.28	0.01	348.84
<i>Buff sekuwa</i>	53.97	3.33	16.37	22.64	0.46	3.23	250.86
<i>Fokso Fry</i>	54.27	2.52	9.84	5.42	0.20	27.76	221.25
<i>Fokso fry 1</i>	66.45	1.05	5.28	6.74	0.05	20.43	156.24
<i>Buff bhutan</i>	55.77	2.03	10.96	30.15	0.33	0.75	222.31

<i>Sapumhicha-1</i>	12.44	1.37	76.46	6.92	0.06	2.75	726.78
<i>Sapumhicha-3</i>	11.63	0.73	76.82	7.94	0.07	2.81	734.36
<i>Buff chhoyela -2</i>	58.93	2.70	10.80	23.34	0.74	3.49	204.49
<i>Kachhela</i>	55.57	2.15	26.19	13.14	2.51	0.44	289.99
<i>Pangra chicken</i>	64.04	2.03	12.15	19.46	0.33	2.00	195.14
<i>Kachhela fried</i>	54.14	2.70	18.91	23.77	0.43	0.05	265.46
<i>Tisa Buff</i>	55.99	2.01	18.84	10.42	1.75	10.99	255.22
<i>Tisa buff-1</i>	50.76	2.78	31.62	10.54	0.51	3.79	341.93
<i>Sapumhicha -2 (honacha)</i>	11.27	0.21	80.42	7.82	0.10	0.18	755.83
<i>Yhakula- buff</i>	60.47	1.54	26.40	8.77	0.10	2.72	283.56
<i>Buff sukuti</i>	33.49	5.56	9.48	41.26	0.47	9.74	289.33
<i>Lean meat buff -raw</i>	75.79	1.30	0.48	22.02	0.00	0.41	94.08
<i>Lab made chhoyela</i>	57.63	2.57	9.06	29.44	0.36	0.95	203.07
<i>Chhoyela Lubhu</i>	57.63	2.57	9.06	29.44	0.36	0.95	203.07
<i>Jibro (buff)</i>	26.90	1.28	32.01	38.29	0.14	1.39	446.79
<i>Gidi (Buff)</i>	55.63	3.08	24.72	13.00	0.51	3.07	286.72
<i>Duck chhoyela</i>	27.68	5.53	33.86	28.37	0.14	4.43	435.90

*The Proximate Nutrient content values are expressed in Wet basis (w.b.)

3.5.2 Profiling of Ethnic Foods of Nepal (Limbu Cuisines)

The Limbus, one of the significant groups among Kirat people, is an indigenous ethnic community of Nepal. A range of indigenous food items and local, homemade alcoholic beverages are found in Limbu community. Such food habits distinguish them from other communities. Amongst them, *Mangdak/lepma*, *sigole*, *papanda*, *kinema*, *yangben*, *sargyangma*, *wamyuk/wachipa/tite* are the traditional food items of the Limbus. Sample of different Limbu cuisines were collected from the market and analyzed for the nutrient composition. The results are shown in Table 3.4. Highest energy value (589.98 Kcal/100g) and crude fat content (53.80%) were observed in pork *aachar* from Bojhu store while the lowest energy value was reported in the fresh *kinema* (151.80 Kcal/100g). The lowest crude fat content was observed in *yangben* (0.4%, w.b.). The highest protein was found in dried *kinema* (36.16%, w.b.) from Bojhu store. The highest fiber was observed in *chimfing* (36.21%) while lowest in cooked maize grits (0.02%, w.b.).

Table 3.4: *Proximate Nutrient content of different Limbu cuisines

Sample name	Moisture %	Total Ash (%)	Crude Fat (%)	Crude Protein (%)	Crude fiber (%)	Carbohydrate (%)	Energy (Kcal/100g)
<i>Kinema -1</i>	9.99	4.73	27.43	34.72	8.94	14.19	442.51
Fresh <i>Kinema</i>	63.87	1.48	7.24	8.35	5.74	13.32	151.80
<i>Chimfing -1</i>	10.44	6.59	8.04	18.72	36.21	19.99	227.26
<i>Yangben -1</i> (Boju store)	13.06	4.18	0.50	7.54	24.06	50.67	237.32
<i>Pork aachar</i> Bojhu store	13.95	3.85	53.80	14.33	1.95	12.12	589.98
<i>Yangben</i> (processed)-2	15.02	4.18	0.43	5.80	22.29	52.29	236.21
<i>Kinema -2</i>	13.03	5.27	18.38	32.49	6.89	23.93	391.16
<i>Kinema</i> -Boju store	11.59	4.98	16.05	36.16	15.65	15.57	351.36
<i>Chimfing-2</i>	11.33	7.42	7.81	16.46	34.53	22.46	225.95
<i>Khanakpa-</i> Taplejung	13.16	5.23	4.41	9.09	35.76	32.35	205.48
<i>Chimfing</i> (Ompari)-3	10.32	6.01	8.88	11.49	33.75	29.55	244.12
<i>Khanakpa</i> (Om pari)	11.24	4.77	3.36	5.81	33.64	41.19	218.20
<i>Kinema-3</i>	10.09	4.57	17.07	16.05	12.49	39.73	376.75
Vitras- <i>Yangben</i> with blood	44.44	2.91	27.47	22.59	2.42	0.18	338.28
<i>Yangben-3</i>	14.34	4.00	0.47	5.68	19.94	55.58	249.23
<i>Chimfing-4</i>	10.71	3.74	7.55	23.10	33.78	21.11	244.83
<i>Wachhipa</i> (only)	22.70	10.63	37.36	19.64	1.38	8.28	444.97
<i>Wachhipa</i> with rice	45.42	5.30	19.11	15.96	0.75	13.46	289.65
<i>Wachhipa</i> with cooked maize grits	56.11	4.23	15.80	14.52	0.92	8.42	233.99
Pork	43.90	1.82	27.70	18.23	0.79	5.56	362.48
<i>Sisnu</i> (with whole black gram)	90.34	1.36	0.95	2.81	0.4	4.41	36.39
Maize grits (cooked)	82.20	0.1	0.53	1.19	0.02	15.97	73.40

*The Proximate Nutrient content values are expressed in Wet basis (w.b.)

3.6 Texture Profile Analysis (TPA) of Newari foods using texture meter

3.6.1 TPA of Newari cuisine (*chhoyela*) using different fruits/spices as tenderizing agents

Chhoyela, a *newari* cuisine, is prepared by marinating the smoked buff with oil, salt, chillies and other spices. The study was focused on the texture profile analysis of *chhoyela*, after being treated with natural

enzymes like papain (papaya), bromelain (pineapple), actinidin (kiwi) and zingibain (ginger). The required raw materials for the study like buff, mustard oil, chilli, spices, fruits were bought from the local market of Kathmandu valley. The texture of the raw buff meat was analyzed. Buff meat was treated with different fruits: papaya, pineapple, kiwi and ginger at the rate of 10 % (w/w) for 24 hours and their texture measured again. Buff meat without any treatments (without any fruits) was considered as control sample. To prepare *chhoyela*, the treated buff meat was barbequed, cut into pieces (uniform dimension), marinated with mustard oil, chilli flakes, other spices. Texture of the prepared *chhoyela* was also analyzed. The texture profile of raw buff meat, enzyme treated buff meat and *Chhoyela* were studied using texture analyzer (TA.XT Plus, Stable Micro Systems Ltd., UK). For the compression test mode, the meat samples were compressed to 30% of their original height at a constant speed of 2.0 mm/s. A diameter plate of 36 mm was used as probe for the study. For the cutting test mode, strain of 45.0% was applied to the meat samples with test speed of 2.0 mm/sec. For the puncture test mode, strain of 25.0% was applied with test speed of 2.0 mm/sec. Among the enzyme treated meat, the lowest cutting force and puncture force were observed in ginger treated raw meat (179.47 N and 4.64 N respectively) while the highest cutting force was observed in pineapple treated raw meat (322.33 N). For *chhoyela*, the lowest cutting force was reported in kiwi treated *chhoyela* (217.68 N) and the lowest puncture force was observed in pineapple treated (15.65 N). The lowest compression force was reported in Papaya treated meat (516.51 N) while that for *chhoyela* was reported in Kiwi treated *chhoyela* (270.29 N). The results showed that higher cutting and puncturing force were found in *Chhoyela* compared to raw meat. This could be due to crust formation after frying and protein denaturation leading to loss of flexibility of muscles. Finally, treatment of meat with tenderizing agents (fruit enzymes) led to lower compression force of *chhoyela* compared to marinated meat.

3.6.2 Texture Profile Analysis of Newari cuisine (*chhoyela*) collected from the different parts of Lalitpur district

Meat, meat products and different kinds of meat are preferred for making various dishes in *Newar* community. *Chhoyela*, a Newari cuisine, is prepared by marinating the smoked buff with oil, salt, chillies and other different varieties of spices. This study focused on the comparison of texture profile of raw lean meat, barbequed meat and *chhoyela*. The lean meat, barbequed meat and prepared *chhoyela* were bought from the market of Kathmandu valley and their texture analyzed using texture analyzer (TA.XT Plus, Stable Micro Systems Ltd., UK). The plate and the methods for compression, cutting and puncturing tests mentioned in the previous section 3.6.1 were used in this study without any alterations. The barbequed meat showed the highest puncture force (475.07 N). The maximum compression force was observed in lean buff meat (506.93 N). Barbequed meat samples despite their origin had similar texture profiles with respect to cohesiveness, springiness and resilience, as heat denaturation of proteins along with the formation of crust occurred in all samples. The difference in texture profile of raw meat samples could be due to different sources of meat animals. Change in texture profile of meat samples after marinating could be due to the effect of different spice combinations used in the preparation. The culmination of different intrinsic and extrinsic factors could have led to the difference in the texture

profile of the samples. Also, resilience is less affected by the treatments compared to cohesiveness and springiness.

3.7 Recipe Development for School Midday Meal Program

Nepal government believes that only a healthy body can develop a healthy brain (स्वस्थ शरीरमा स्वस्थ मस्तिष्कको निर्माण हुन्छ). Thus, to practically achieve this, Nepal government has launched the midday meal program in all public schools since the F.Y. 2077/78. Under this program, all students up to class five should receive midday meals at school, which should cover at least 30% of their required daily calorific values. Furthermore, a menu comprising of different midday meals has been developed for different regions using internationally established Menu Planning Tool (MPT) and the Nepalese Food Composition Table (FCT) and published by the Education and Human Resource Development Centre, Sanothimi, in the form of 'विद्यालय दिवा खाजा व्यवस्थापन सहयोगी पुस्तिका २०७७'. In line with this program, FTDND has been carrying out the nutritious recipe development program every year to verify the recipes and provide feedback for further improvements to GoN about nutritious midday meal to school children.

3.7.1 Nutritious *Roti* (Chayote and Soya body Incorporated)

Roti a flat bread, commonly consumed in many South Asian countries, are generally made from an unleavened dough of ground whole wheat flour and water. The major objective of this study is to utilize locally available food resources to develop nutritionally balanced food for the school children. The food should be easy to prepare, affordable and cost effective. Whole wheat flour, soya body, chayote, eggs and other spices with oil were used as the ingredients. Three different recipes were studied; T1 (80g: 20g), T2 (70g: 30g), T3 (60g: 40g) varying the proportion of whole wheat flour and Soya body. Based on Sensory evaluation carried out among 12 panelists, T1 was rated as the best on the basis of physical appearance, texture and color but on the basis of taste and flavor T2 was found to be the best. The nutritional content per serving (285-330g) was found to provide approximately 83%, 34% and 47% of the recommended energy, protein and fat values respectively. The cost of T1 was found to be NRs. 23.00 per serving which is higher than the allocated cost of NRs. 15.00. The price of this nutritious *roti* if prepared in large scale can be cost effective.

3.7.2 Nutritious *Chukauni*

Chukauni is a salad prepared from potatoes, peas and homemade curd with various curry spices. *Chukauni* is a famous side dish in Nepal and can be served warm or cold. Three different recipes were studied, T1 (50g: 40g), T2 (60g: 30g), T3 (70g: 20g), varying the proportion of boiled potato and peas, among which T2 was found to be the best. Energy value from a serving of *chukauni* (210 g) covered 32%, 70% and 32% of the recommended energy, protein and fat values respectively at the cost of NRs. 18.78. Though, the price per serving was higher, energy contribution by *chukauni* was found to be low. Thus, *chukauni* should be complemented with other foods in order to fulfill the recommended calorie.

3.7.3 Millet Incorporated *Aalu Paratha* and mixed vegetable curry

Millet is the fourth most important crop in Nepal having multiple benefits. Millet incorporated *aalo paratha* was made using wheat flour and millet flour (1:1) stuffed with mashed potato and spices. This *paratha* was served along with mixed vegetable curry comprising of seasonal vegetables and dried green peas. Based on proximate analysis carried out in laboratory, a serving set of millet *aalo paratha* (96 g) along with mixed vegetable curry (90 g) was found to provide 60%, 54% and 100% of the recommended energy, protein and fat values respectively at the cost of NRs. 16.49.

3.7.4 Millet Incorporated Pasta

Millet incorporated pasta was prepared by replacing 50% of wheat flour with millet flour, cooked with mixed vegetables, various spices and oil. Based on proximate analysis carried out in laboratory, a serving of millet incorporated pasta (198 g) provided 55%, 104% and 54% of the recommended energy, protein and fat values respectively at the cost of NRs. 20.00.

3.7.5 Millet Incorporated *Kwati*

Kwati is a mixed soup of nine types of sprouted beans. It is loaded with protein and is very nutritious. Millet incorporated *kwati* was prepared with millet dough sheets with variety of seasonal vegetables and spices. On the basis of proximate analysis carried out in laboratory, a serving of millet incorporated *kwati* (551 g) was found to provide 89%, 129% and 59% of the recommended energy, protein and fat values respectively at the cost of NRs. 17.06.

3.8 Baseline Study of Different Local/Traditional Foods for Food Standardization Purpose

Food Technology Development and Nutrition Division has also been carrying out baseline study of local/traditional food and food products for food standard development purpose. *Akabare* chilly and large cardamom (*alaichi*) from different regions of the country were collected and analyzed for the baseline study in this fiscal year.

3.8.1 Physico-chemical Analysis and Grading of *Akabare* and Large Cardamom (*Alaichi*) Cultivated in Different Regions of Nepal

Akabare (*Capsicum spp.: Capsicum annum L. var cerasiforme* Irish), also known as *Dalle* or *jyanmara khursani* is a popular native chilly variety of Nepal, valued for its exceptional heat and unique flavor. It is also an important income-generating crop of Eastern region. As chilly is open pollinated crop, the quality of *Akabare* varies widely in terms of shape, size, color, seedlings, hotness, pungency and flavor within the same batch and from batch to batch. Standardization and grading are prerequisites for improved marketing and better price for commodities. Classification of fresh *Akabare* to various groups based on factors like size and color of the fruits, damaged or discolored pods, broken chillies and presence of foreign matter will further facilitate its use and fair pricing for different intended purpose (fresh consumption, drying, pickling, volatile oil and oleoresin extraction etc.). Further, commodity

standards and grades provide means for measuring levels of quality and value for agricultural commodities. So far, there is no grades and commodity standard for *Akabare* in Nepal.

Likewise, the large cardamom (*Amomum subulatum Roxb.*), locally known as *Alaichi*, is also one of the Nepal's largest export crops. A large variety of cardamoms are cultivated in Nepal and their quality depends on various factors like variety, maturity at harvest, curing time, method of drying, packaging and storage conditions. There is a local practice of grading *Alaichi* like Jumbo jet, Super deluxe and *Chalan chalti* based on personal observation of size, color and tail cutting. But, no standard grades have been developed based on the study of size, density and physiochemical parameters for *Alaichi*.

This study was undertaken to analyze the physiochemical parameters of *Akabare* and *Alaichi* grown in different regions of Nepal. The findings of the study will be useful in formulating grades and commodity standard of *Akabare* and *Alaichi*.

A. Baseline study of *Akabare*

Fresh *Akabare* collected from different regions showed variation in the physiochemical parameters like moisture, protein, crude fiber and oleoresin. *Akabare* of Ilam was higher in the oleoresin content followed by Dolakha variety. Samples collected from Palpa were lower in oleoresin content. The difference could be attributed to the difference in variety, geographical region, and maturity of produce during harvest. The minimum to maximum range of length, width and weight of collected samples of *Akabare* were 14.3-46.3 mm, 11.1- 37.7 mm and 1.32 -12.1 g respectively. The frequency distribution of *Akabare* samples on length, width and weight showed majority of sample fall within the range 18.1 – 30.0 mm in length (72 - 82%), 14.1 – 26.0 mm in terms of width (71 - 99%) and 2.1 – 5.0 g in terms of weight (59 - 86%). The results of physico-chemical analysis of *Akabare* is given in Table 3.5.

Table 3.5: Physico-chemical parameters of *Akabare* cultivated in different regions of Nepal.

Samples	Moisture (%)	Ash (%)	Protein (%)	Crude fibre (%)	Oleoresin (%)	Essential oil (%)	AIA (%)
Dolakha	78.18	3.48	6.63	21.16	8.03	1.47	0.06
Palpa, Rabdikot	71.22	3.08	4.49	18.63	5.87	0.99	0.09
Palpa, Mathagadi	74.73	3.85	8.69	19.21	6.51	1.2	0.09
Ilam	78.81	4.16	4.78	25.73	9.57	1.69	0.06
Palung	73.68	3.14	9.06	23.44	7.07	2.41	0.07

Note: All the values are expressed as dry weight basis (d.b.) except moisture content (w.b.)

B. Baseline study of Large cardamom (*Alaichi*)

Alaichi seed samples varied widely in terms of volatile oil content. The method of curing affected the volatile oil content. Improved method and double drum dried *Alaichi* samples retained higher volatile oil content compared to samples dried in traditional *Bhatti*. Variation was also observed in length, width and bulk density of *Alaichi* samples collected from different regions. The frequency distribution of *Alaichi* samples on length, width and weight showed majority of sample fall within the range 17.1 – 23.0 mm in length (65 - 72%), 9.1 – 13.0 mm in terms of width (50 - 75%) and 0.6 - 1.5 mm in terms of weight (44 - 87%). The results of physiochemical analysis of *Alaichi* is shown in Table 3.6.

Table 3.6: Physico-chemical parameters of *Alaichi* collected from different regions of Nepal.

Sample	Moisture (%)	Ash (%)	Protein (%)	Crude fibre (%)	Oleoresin (%)	Vol. oil (%)	Bulk density (kg/m ³)
Traditional Bhatti , Ramechhap	11.32	4.34	7.49	11.77	2.78	2.47	351.75 ± 7.56
Traditional Bhatti, Ilam	10.89	4.97	6.55	6.08	2.71	2.71	339.50 ± 8.78
Traditional Bhatti, Taplejung	10.34	4.29	8.40	11.64	2.41	2.74	-
Improved Bhatti, Ramechhap	9.52	4.50	6.90	10.55	2.96	4.17	385.50 ± 3.64
Improved Bhatti, Bhojpur	11.11	4.20	7.49	12.43	2.78	2.55	-
Double drum Ramechhap	9.90	4.40	6.23	11.37	2.76	4.18	360.75 ± 1.47

3.8.2 Effect of Temperature and Emulsion Treatment on the Quality of Dried *Akabare Chilly*

Chillies on harvesting have a moisture content of 65 - 80% depending on whether partially dried on the plant or harvested while still succulent; this must be reduced to 10% to prepare dried spice. Traditionally, this has been achieved by sun drying fruits immediately after harvesting without any special treatment. Also, chillies are dried on open spaces, mostly roadsides, without the benefit of mattings or concrete platforms, and remain exposed to weather for the whole of dryings period (14 - 21 days). Consequently, fruits become contaminated with dust and dirt, damaged by rainfall and pests. Under these conditions, losses can be as high as 70 - 80 % of the total quantity. Several improved methods of chilly drying have been studied; drying in single and multitier tray system, in sun and in shade, and also effect of blanching and emulsion pretreatment. Studies has shown that improved method

have enhanced the rate of drying, more hygienic and better quality product, higher yield, and better retention of colour and pungency. Likewise, a study was done to study the effect of different drying temperature and emulsion treatment on the quality of dried *Akabare* chilly. Fresh ripe *Akabare* chilly was purchased from agricultural farm of Palung. The fresh chilly was washed with potable water. Then, a part of washed chillies was dipped in water based emulsion containing calcium carbonate (2.5%), refined Soyabean oil (1%), gum acacia (0.1%) and Butylated Hydroxyl Toluene (0.001%) for 5 minutes. Excess of emulsion was drained and chillies were dried at different temperature (sun drying, cabinet drying at 40 °C and 60 °C). The control samples without emulsion treatment at varied temperature were also prepared and analyzed for different physico-chemical properties. The results on effect of temperature and treatment on quality parameters of dried chilly are presented in Table 3.7 and 3.8. This study showed that emulsion treatment led to better oleoresin and volatile oil retention and higher yield in shorter drying time compared to untreated samples dried at similar temperature. In conclusion, *Akabare* chilly dried at 40 °C was superior in overall quality parameters like volatile oil, oleoresin, redness (higher a* value measured with CR-400 Chroma meter) and yield.

Table 3.7: Moisture, Volatile oil, Oleoresin, Yield and drying time of dried chillies.

Samples	Moisture content (%)	Volatile oil, (%, d. b)	Oleoresin (%, d.b)	Yield (%)	Drying time (h)
Sundried, (20-22 °C) control	7.01	0.71	5.02	11.60	288
Sundried, (20-22 °C) treated	8.70	0.77	9.41	15.20	192
40 °C, untreated	6.06	0.98	7.72	21.40	84
40 °C, Treated	6.80	1.15	11.93	20.70	56
60 °C, untreated	1.13	0.43	11.33	16.70	40
60 °C, Treated	1.80	0.54	12.34	15.40	40

Table 3.8: Redness color value of dried chillies.

Samples	Redness (*a values)		
	Sundried (18-23 °C)	Cabinet dried (40 °C)	Cabinet dried (60 °C)
Whole dried pods, control	37.8 ± 3.5	36.2 ± 4.1	29.2 ± 4.9
Whole dried pods, emulsion treated	37.1 ± 3.9	40.3 ± 4.2	31.4 ± 3.8

4. Sanitary and Phytosanitary (SPS) National Enquiry Point

The SPS National Enquiry Point has been established at DFTQC as per provision on transparency in WTO SPS Agreement in order to respond query made by WTO member countries or SPS related stakeholders. In fiscal year 2079/80, the following activities were accomplished:

- 1) SPS enquiry services such as SPS enquiry on mandatory food standards and SPS notifications were timely responded.
- 2) SPS notification works were accomplished.
- 3) Stakeholders meeting on working guidelines of SPS National Enquiry Point was performed.

Up to this fiscal year, the rules, regulations and guidelines notified by SPS National Enquiry Point is shown in Table 4.1.

Table 4.1: SPS Notifications till Fiscal Year 2079/80.

S.N.	Notification
1.	Quarantine pest of Gerbera , Carnation, Cauliflower
2.	Standard of Rice Bran Oil
3.	Quarantine standards for Day Old Chicks, Table Egg
4.	Proposed quality standard for Cornflakes, Preservatives
5.	Proposed mandatory quality standard for fortified wheat flour
6.	Plant Protection Rule, 2010
7.	Plant Protection Act, 2007
8.	Plant Protection Act, 2007-Extension of the comment Period (Add.)
9.	Notification regarding the establishment of animal
10.	National Plant Quarantine Pests of apple, citrus,
11.	Standards of Maize (corn), Wheat, Paneer, Cinnamon powder and Wheat flour
12.	All Products–Phytosanitary Certificate– Extension of the comment period
13.	Directives on Export Import Inspection and Quality Certification System (Food)
14.	Brief recap of the Original Notification (Add.)
15.	Blended Edible Vegetable Oil Standard
16.	Avian influenza (bird flu) (Emergency Notification)
17.	Animal Slaughter house & Meat Inspection Act and Regulation
18.	Animal Quarantine Working Procedure, 2007
19.	Animal Health & Livestock Services Act, 1998 and Regulation (Add.)
20.	All Food Products–Directives on Export-Import (Add.)

21.	Phyosanitary Certificate
22.	Processed Drinking Water/Mineral Water
23.	Standard for Whiskey, Brandy, Gin and Vodka
24.	Maximum Limit of Aflatoxin and Melamine
25.	Standard for Processed Milk, Low Fat Milk, Full Cream Milk Skimmed Milk.
26.	Glossary of Phyosanitary terms
27.	Maximum Residue Limit of Pesticides on fresh fruits, vegetables and tea
28.	Proposed Quality and Safety Standards of Pustakari, Gundpak
29.	Proposed Quality and Safety Standards of Pustakari, Dalmoth and Beaten Rice
30.	Fruit Juices
31.	Fruit Beverages
32.	Fruit Nectar
33.	Proposed Maximum Residue Limits of Pesticide for Fruits and Vegetables
34.	Maximum Limit of Industrial Trans-fat in Food Products
35.	Prohibition in Use of Inked Paper in Food

5. Other Activities

In this fiscal year, other activities conducted by the department are as follows:

5.1 World Food Safety Day

World Food Safety Day was celebrated on June 7, 2023 with the global slogan " Food Standards Save Lives" with a week-long (June 1-7) food safety related awareness, interactions, market and hotel/restaurant monitoring, street food safety targeted programs and other programs. On the occasion of World Food Safety Day (June 7, 2024), key messages from Rt. Hon'ble Prime Minister, Hon'ble Minister of Agriculture and Livestock Development, Secretary (Agriculture Development) and Director General of DFTQC was published in Gorkhapatra National Daily. On the same day, morning rally was followed by main event of World Food Safety Day.

5.2 Inspection regarding the use of prohibited artificial ripening agents

Inspection regarding the use of prohibited artificial ripening agents in fruits was conducted 70 times across the country. During inspection, prohibited carbide used 85 kg mango was disposed at Sindhuli and Surkhet. Use of ethylene ripener was also found during inspection.

5.3 Laboratory Information Management System (LIMS)

Web based Laboratory Information Management System for National Food and Feed Reference Laboratory of Department of Food Technology and Quality Control has been developed under Strategic

Road Connectivity and Trade Improvement Project (SRCTIP) supported by World Bank. The system was developed with the objective to manage laboratory service more efficiently and effectively.

5.4 Antimicrobial Resistance (AMR) in Food Sector

According to WHO, Antimicrobial Resistance (AMR) is one of the top 10 global public threat that will cost 10 million lives and \$100 trillion dollars by 2050, if there is no any proactive approaches will be implemented. AMR may be transmitted to humans through the various stag of food chain and the environmental degradation due to irrational use of antibiotics, limitation in detection of microorganisms and inadequate regulations and surveillance mechanism.

Since, one health approach becomes effective tools to combat against AMR, DFTQC is one of the major stakeholders of one health approach of AMR and has been contributing its extensive efforts in drafting NAP-AMR (2023-2027), which is in the progress of approval by GoN. Surveillance of AMR in food sector has been started with support from Fleming Fund Country Grant Nepal (FFCGN) with the technical support of FHI-360 Nepal and FAO Nepal since December 2021 and July 2023 respectively. In Food Sector, three potential bacterial pathogens *viz E.coli, Staphylococcus aureus, Salmonella spp* have been prioritized for AMR surveillance but in near future, *Enterococcus faecalis* and *Enterococcus faecium* will added as scope in AMR Surveillance.

Major activities carried out in Antimicrobial Resistance in food sector

- **Formation of AMR Food- Technical Working Group (TWG):**

Technical Working Group on AMR surveillance in food sector was formed in December 2021 with multisectoral members participation. The TWG is chaired by Director General of DFTQC and includes participation of officials from DFTQC, NPHL, CVL, DoE and external development partners such as FAO , WHO and FFCGN. TWG food sector regular meeting is organized in every quarter in DFTQC.

- **Laboratory Strengthening and Capacity Building**

Both developmental partners FAO and FFCGN are giving logistic and technical support for capacity building to carry out AMR activities in DFTQC. It includes, technical support for onsite coaching to microbiology staffs of NFFRL for bacterial isolation, identification, Antibiotic Susceptibility Testing, long term and short term bacterial storage from different official of NPHL and CVL. Two officials were trained from BQPMC Bangkok and Chulalongkorn University Bangkok on antibiotic residue analysis and antibiotic susceptibility testing respectively.

- **AMR awareness program**

DFTQC is actively participating in World Antimicrobial Awareness Week yearly since 2021. Different brochures and communication materials regarding antimicrobial resistance are developed in both English and Nepal version.

With support from Action to support implementation of Codex AMR Texts (ACT) project , three

days TOT program on AMR was conducted on 25 - 27 Baisakh, 2080 with 25 participants from food, animal, health sector. Likewise, Food-borne AMR and CODEX standards Awareness campaign in Food safety and Vet/Agri colleges (CAFODAT, HICAST) was held on 18-25 May around Kathmandu and Chitwan .

- **AMR Surveillance in food sector**

With the support of FFCGN, the Microbiology Lab in NFFRL has initiated AMR surveillance in food sector from December 2021 in animal origin food products. *E. coli*, *Salmonella spp.* and *Staphylococcus aureus* were the targeted organism for AMR surveillance in food sector.

Similarly, a pilot study on active AMR surveillance on ready to eat meat products produced around Kathmandu valley was carried out in May – Sept 2022. Altogether 126 samples of sausage, salami and patties were collected from 18 different industries by purposive random sampling technique.

- **Quality Control Activities**

Microbiology lab of NFFRL has been continuously participating in National as well as International Quality Control program on Antibiotic Susceptibility testing.

- **Assessment of laboratories by using FAO ATLASS tool**

With the support of AMR Codex Text (ACT) project of FAO Nepal, FAO ATLASS (Assessment tool for laboratories and Antimicrobial Resistance Surveillance system) assessment of microbiology lab of NFFRL was conducted during 19-21 September, 2023. Prof. Dr Rungtip and Dr. Patrrarat from Chulalongkorn University, Bangkok delivered two days training for ATLASS assessor and assessed microbiology lab on laboratory module by using FAO ATLASS tool.

Similarly, DFTQC organized an assessment of national AMR surveillance system in food and agriculture sectors using FAO ATLASS tool along with stakeholders' workshop in OH approach during 11-14 December 2023 in Kathmandu with the support of AMR Codex Text Project, FAO Nepal.

6. Revenue Collection

Revenues are generated from services like laboratory analysis and licensing of food/feed industries. The analytical fee depends on the parameter to be analyzed. Details of non-tax revenue rates for laboratory analysis services as published in Nepal Gazette is given in Annex 2. Table 5.1 shows the detail of revenue collection in this fiscal year.

Table 5.1: Revenue collection in the fiscal year 2079/80.

S.N.	Office	Revenue collection in thousands
1	DFTQC, Kathmandu	14676
2	FTQCO, Biratnagar	3875
3	FTQCO, Janakpur	2545
4	FTQCO, Hetauda	1975
5	FTQCO, Pokhara	1503
6	FTQCO, Bhairahawa	4681
7	FTQCO, Nepalgunj	1616
8	FTQCO, Surkhet	309
9	FTQCO, Dhangadhi	1377
10	FIEQCO, Kakarvitta	3812
11	FIEQCO, Rani	3566
12	FIEQCO, Jaleshwar	2387
13	FIEQCO, Birgunj	8102
14	FIEQCO, Tatopani	20
15	FIEQCO, Rasuwa	151
16	FIEQCO, Belahiya	12748
17	FIEQCO, Krishnanagar	4770
18	FIEQCO, Nepalganj	8639
19	FIEQCO, Dhangadhi	3394
20	FIEQCO, Mahendranagar	1024
21	FIEQCO, TIA	334
	Total	81,504

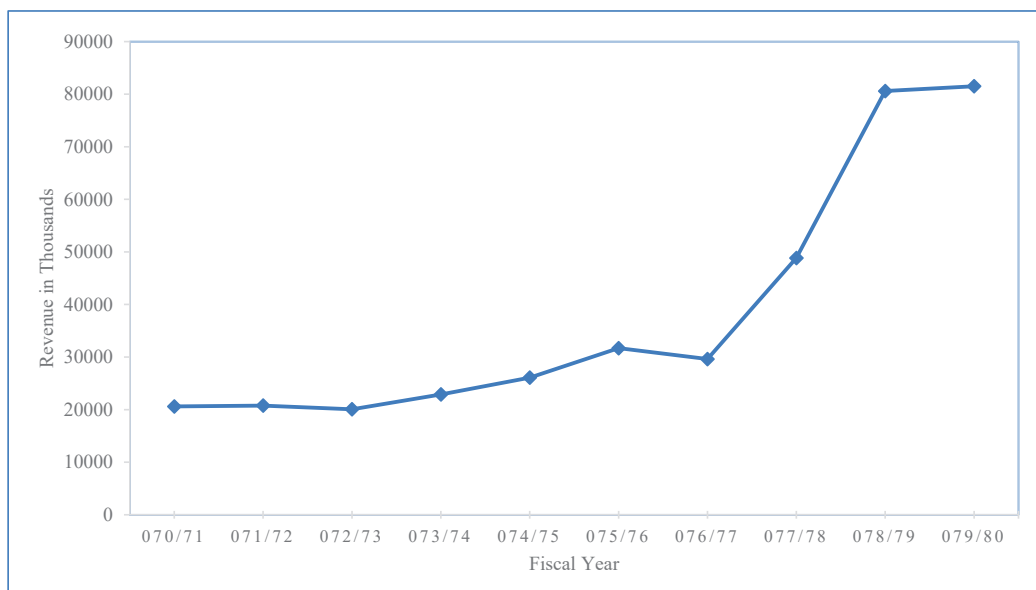


Figure 5.1: Revenue Collection for Past Ten Years.

Figure 5.1 shows the trend of revenue collection over past ten years. From the figure, it can be observed that the revenue collection is increasing every year. This was due to increase in the number of samples analyzed by the laboratories for import/export certification, licensing purpose, requested samples, lot verification etc. After the establishment of 24 division offices and 8 new food import/export quality certification offices in the fiscal year 075/76, revenue collection increased gradually due to increase in number of samples received for import/export certification at custom points and increased awareness about the legal provision of licensing for food business operators. In the fiscal year 078/79, the revenue collection has nearly doubled in comparison to previous year after beginning the testing of pesticide residue analysis using rapid bioassay of pesticide residue (RBPR) from 1st of Kartik, 2078.

ANEXES

Annex 1



**National Accreditation Board for
Testing and Calibration Laboratories**

CERTIFICATE OF ACCREDITATION

**NATIONAL FOOD & FEED REFERENCE LABORATORY, DEPARTMENT
OF FOOD TECHNOLOGY AND QUALITY CONTROL (DFTQC)**

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at
Babarmahal, Kathmandu, Nepal

in the field of

TESTING

Certificate Number

TC-4062

Issue Date

31/03/2023

Valid Until

30/03/2025

**This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to
continued satisfactory compliance to the above standard & the relevant requirements of NABL.**

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Ministry of Agriculture and Livestock Development, Government of Nepal

Signed for and on behalf of NABL



89076970100030002582

**N. Venkateswaran
Chief Executive Officer**

Scope of Accreditation of NFFRL

Discipline- Food and Agricultural Products: Chemical testing

S. N.	Commodities	Parameter tested/ Specific Test Performed
1	Edibles Fats and Oils	Acid value
		Free fatty acid
		Iodine value
		Peroxide value
		Refractive index
		Saponification value
2	Fruit and Vegetable products <i>(Juice, Jam, Jelly, Sauce, Concentrates, Pickles, fruit candies, Canned foods etc.)</i> -	Acidity
		Acidity of extracted fat
		Ash insoluble in dil. HCL
		Drained Weight
		Fill of Container
		pH
		Reducing sugar content
		Sodium chloride
		Total soluble solids (TSS)
		Total sugar content
3	Spices and Condiments Products <i>(Ginger, Cardamom, Turmeric, Cumin, Coriander, Cloves, Pepper, mix spices powder, Chilly powder, Salts etc.)</i>	Damaged / discolored fruits
		Extraneous Matter
		Insect damaged matter
		Acid Insoluble Ash
		Alcohol soluble Extract
		Cold water soluble extract
		Crude fibre
		Curcumin
		Moisture
		Nonvolatile ether extract
		Total ash
		Volatile oils
		Water Soluble Ash content
		Test of Lead Chromate
		Piperine content (for black peppers)
		Iodine content in salt
		Moisture in salt
		Sodium chloride in salt
		Water insoluble matter in salt
		Water soluble except NaCl
4	Tea and Coffee Products	Acid insoluble Ash
		Alkalinity of Soluble Ash
		Alkalinity of Soluble Ash
		Crude fibre
		Total ash
		Water extract
		Water soluble ash

		Caffeine
5	Cereal and Cereal Products (<i>Bakery and Confectionary products, feeds, pulses and cereal products (instant noodles, biscuits, bakeries, infant foods, snacks, wheat flour, etc.)</i>)	Acid value of extracted fat
		Alcoholic acidity
		Ash insoluble in dil. HCL
		Crude fibre
		Fat
		Gluten
		Moisture
		Nitrogen content
		Peroxide value of extracted fat
		Protein
		Total Ash
6	Honey Products (<i>Honey and Honey products; and Sugar, and Sugar Products</i>)	Acidity as formic acid
		Ash Content %
		Electrical conductivity
		Moisture
		Reducing Sugar %
		Specific gravity at 27 ^o C
		Sucrose %
		Water insoluble matter %
		Fructose-glucose ratio
		Hydroxymethyl furfural (HMF)
7	Milk and Milk products (<i>Fluid milk, Skimmed, whole milk powder, condensed milk, Ice creams, Yogurt, Sweets, Churpi/hard cheese, Ghee etc.</i>)	Acidity
		Ash content
		Fat
		Milk fat
		Moisture
		Protein
		SNF
		RM value in Ghee
8	Processed Meat and Meat Products (Sausage, frozen meat products, Ham, Bacon Canned meat, etc.)	Sodium Nitrite
9	Fruit and vegetable products: Food Additives and Preservatives (<i>Juice, Jam, Jelly, Sauce, concentrates, Pickles, candies, Canned foods etc.</i>)	Sulphur Dioxide (SO ₂)
		Benzoic Acid
		Tartrazine
		Sunset Yellow
		Carmosine
		Asulfame-K
		Aspartame
		Saccharine
		Sorbic acid
		Rhodamine B
10	Tea and Coffee (Food Additives and Preservatives)	Asulfame-K
		Aspartame
		Saccharine
11	Bakery and Confectionary products, Feeds, pulses and cereal products (instant noodles, biscuits, Bakeries, infant foods, Snacks, Wheat flour)	Sorbic acid
		Monosodium glutamate
12	Packaged Drinking Water (<i>Chemical testing</i>)	Alkalinity
		Chloride content
		Hardness
		pH
13	Processed Drinking Water <i>Residues in Water (Trace metals):</i>	Aluminium
		Arsenic
		Cadmium
		Chromium

		Lead
		Manganese
		Mercury
		Nickel
		Selenium
		Silver
		Copper
		Iron
		Zinc
		Calcium
		Magnesium
		Sodium
14	Organochlorine Pesticides in Fruits and Vegetables by GCMS	4, 4- DDD, SS
		4,4'-DDE, SS
		4,4'-DDT
		Aldrin, SS
		Alpha-BHC, SS
		Alpha-Chlordane, SS
		Beta-BHC, SS
		Delta-BHC, SS
		Dieldrin, SS
		Endosulfan I (Alpha) ,SS
		Endosulfan II (Beta), SS
		Endosulfan Sulphate,SS
		Endrin Aldehyde, SS
		Endrin Ketone, SS
		Endrin, SS
		Gamma- Chlordane, SS
		Gamma-BHC(Lindane), SS
		Heptachlor, 99 %, SS
		Heptachlor-epoxide Isomer B, SS
		Methoxychlor
15	Organophosphorus Pesticide in Fruits and Vegetables by GCMS	Chlorpyrifos
		Dichlorovous
		Dicofol
		Dimethoate
		Disulfoton
		Ethion
		Famphur
		Malathion
		O,O,O-Triethylphosphorothioate
		Parathion
		Parathion methyl
		Phorate
		Phosalone
		Quinolfos
		Sulfotep
		Thionazine
16	Organophosphorus Pesticide in Fruits and Vegetables by LC-TQ Method	Dimethoate
		Ethoprofos
		Methodathion
		Monocrotophos
		Trichlorofon
		Accephate
17	Synthetic Phyrithroides Pesticides in Fruits and Vegetables by GCMS	alpha-cypermethrin
		Fenpropathrin
		Permethrin I
		Permethrin II

		Fenvalerate
		Beta-Cyfluthrin
		Deltamethrin
		Cyhalothrin
18	Carbamates groups of Pesticides in Fruits and Vegetables by LCTQ	Aldicarb
		Aldicarb-sulfone
		Aldicarb-sulfoxide
		Carbaryl
		Carbofuran
		Carbofuran-3-hydroxy
		Methiocarb
		Methomyl
		Oxamyl
		Propoxur
19	Other group of pesticides in Fruits and Vegetables	Carbendazim and benomyl (sum of benomyl and carbendazim expressed as carbendazim)
		Thiobendazole
		Imazalil
		Imidacloprid
		Propargite
		Metalaxyl
		Cyprodinil
		kreosoxim-methyl
		Penconazole
		Alachlor
		Captan
20	Pesticides in Tea and Coffee	Propoxur
		Glyphosphate,
		Dicofol
		Ethion
		Quinolphos
		Glufosinate-ammonium
		Propargite
21	Pesticides: Spices and Condiments (Ginger, Cardamom, Turmeric etc.)	Fosetyl-A1
		Endosulfan A
		Monocrotophos
		Quinolphos
22	Mycotoxins: Fruits & Vegetable (Processed Products: Juice, Jam, Jelly, pickle, Candies)	<u>Patulin</u>
23	Mycotoxins: Bakery and Confectionary products, feeds, pulses and cereal products (instant noodles, biscuits, Bakeries, infant foods, Snacks, Wheat flour etc.)	Ochratoxin A
		Total Aflatoxin
		Aflatoxin B1
		Aflatoxin G1
		Aflatoxin B2
		Aflatoxin G2
		Deoxynivalenol (DON)
24	Trace Metal Elements: Cereal and Cereal Products: (Bakery and Confectionary products, feeds, pulses and cereal products (instant noodles, biscuits, bakeries, infant foods, snacks, wheat flour, etc.)	Calcium
		Magnesium
		Potassium
		Sodium
		Iron
		Zinc
		Copper
		Mercury
		Arsenic
		Cadmium

		Lead
25	Trace Metal Elements: Tea and Coffee	Mercury
		Lead
		Arsenic
		Cadmium
		Copper
		Zinc
		Iron
26	Trace Metal Elements: Fruits & Vegetable Products(Processed Products: Juice, jam, jelly, pickle, candies)	Calcium
		Cadmium
		Potassium
		Sodium
		Magnesium
		Mercury
		Lead
		Arsenic
		Methyl Mercury (In terms of Mercury)
		Copper
		Iron
		Zinc
27	Trace Metal Elements: Spices and Condiments (Ginger, Cardamom, Turmeric)	Calcium
		Cadmium
		Lead
		Copper
		Arsenic
		Zinc
		Iron
28	Trace Metal Elements: Sweetening Products: Honey and Honey products; Sugar, Sugar products	Cadmium
		Lead
		Arsenic
		Mercury
		Copper
		Zinc
		Iron

Discipline- Food and Agricultural Products: Biological Testing

1.	Fruit and vegetable products (Juice, Jam, Jelly, Sauce, Concentrates, Pickles, candies, Canned foods etc.)	Total Bacterial Count, cfu / ml or g
		Yeast & Mould Count, cfu / ml or g
		Coliform count
		Escherichia Coli
		Enterobacteriaceae
		Staphylococcus aureus
		Salmonella spp.
2.	Bakery and Confectionary products, pulses and cereal products (instant noodles, biscuits, infant foods, Snacks etc.)	Total Bacterial Count, cfu / ml or g
		Yeast & Mould Count, cfu / ml or g
		Coliform count
		Escherichia Coli
		Enterobacteriaceae
		Staphylococcus aureus

		Salmonella spp.
3.	Milk and Dairy products (Fluid milk, Skimmed, whole milk powder, condensed milk, Ice creams, Yogurt, Sweets, Churpi/Hard cheese etc.)	Total Bacterial Count, cfu / ml or g
		Yeast & Mould Count, cfu / ml or g
		Coliform count
		Escherichia Coli
		Enterobacteriaceae
		Salmonella spp.
		Staphylococcus aureus
4.	Processed Meat and Meat Products (Sausage, frozen meat products, Ham, Bacon Canned meat, fish, seafood etc.)	Total Bacterial Count, cfu / ml or g
		Yeast & Mould Count, cfu / ml or g
		Coliform count
		Escherichia coli count
		Enterobacteriaceae
		Salmonella spp.
		Staphylococcus aureus
5	Spices and Condiments (Ginger, Cardamom, Turmeric, mix spices powder, chilies powder etc.)	Salmonella (abs in 25 gm.)
		Staphylococcus aureus
6	Processed drinking water, Packaged Natural mineral water	Total Bacterial Count, cfu / ml
		Yeast & Mould Count, cfu / ml
		Coliform count
		Escherichia coli count
		Salmonella spp.
7.	Dietary Supplement (Dietary fibres, Fortified foods, Probiotics, Soy proteins etc.)	Total Bacterial Count, cfu / ml
		Yeast & Mould Count, cfu / ml
		Coliform count
		Escherichia coli count
		Enterobacteriaceae
		Staphylococcus aureus



National Accreditation Board for
Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

**FOOD AND FEED LABORATORY, FOOD
TECHNOLOGY AND QUALITY CONTROL OFFICE**
has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

Biratnagar-10, Morang, Province No. 1, Nepal

in the field of

TESTING

Certificate Number

TC-4057

Issue Date

31/12/2022

Valid Until

30/12/2024

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Dept. of Food Technology and Quality Control, Ministry of Agriculture and Livestock Development, Government of Nepal

Signed for and on behalf of NABL



89076970100030002573

N. Venkateswaran
Chief Executive Officer

Accreditation Scope of Food and Feed Laboratory, Food Technology and Quality Control Office, Biratnagar.

SN	Commodities/Group of Products	Parameter
1	Spices (Ginger, Cardamom, Cumin, Coriander, Cloves, pepper)	Moisture, volatile oil, Total ash, AIA
2	Tea and coffee	Moisture, Total Ash, Water/Aqueous Extract
3	Cereal and cereal products	Moisture, Total ash, AIA
4	Honey	Moisture, Ash, Acidity, Water insoluble matter
5	Fats and oil	RI, AV, PV, melting point
6	Fruits and vegetable products	TSS, pH, acidity
7	Milk	Fat, SNF

Annex 2

Non-tax revenue rates for Laboratory analysis services as published in Nepal Gazette, 2078/04/25,
section 71, Number 17, Part 5.

S.N.	Food Products	Revenue (NPR)
01.00 Milk and Milk Products		
1	Infant Milk Food	1000/-
2	Whole milk powder	1,500/-
3	Skimmed milk powder	1,500/-
4	Fluid milk	650/-
5	Condensed milk	700/-
6	Butter	1,500/-
7	Frozen Dessert	1,500/-
8	Ice cube	1,000/-
9	Yoghurt	900/-
10	Cream	500/-
11	Paneer	500/-
12	Processed milk	650/-
13	Nutrient content and microbiological test of Infant Food	For nutrient content, as per code no. 12, and for microbiology as per code no. 17
02.00 Fats and Oils		
1	Edible Vegetable Oil	700/-
2	Crude oils	400/-
3	Mustard oil/Rapeseed oil	1,100/-
4	Ghee (Cow / Buffalo)	800/-
5	Vegetable Ghee	800/-
6	Peanut butter	1,000/-
7	Bakery Shortening	800/-
8	Mustard seeds	300/-
9	Coconut powder	1,000/-
03.00 Fruits and Vegetable Products		
1	Jam, Jelly, Marmalade, Squash, Fruit juice, Beverages etc.	800/-
2	Tomato ketchup, Sauce including microbiological test	1,200/-
3	Pickles (excluding preservatives test)	500/-

4	Tomato juice and other juices	600/-
5	Canned Fruits	800/-
6	Soft drinks, Soda, Energy drinks, Sports drinks, Carbonated beverages etc.	1,000/-
7	Fruit beverage powder	500/-
8	Vinegar	800/-
04.00 Spices and Condiments		
1	Spice seed Grading	300/-
2	Spice powder	600/-
3	Seasoning powder	500/-
4	Prawn cracker	500/-
5	Dried Ginger	900/-
05.00 Tea, Coffee, Cocoa Products		
1	Tea and Coffee	700/-
06.00 Salt		
1	Edible Salt	700/-
07.00 Cereal and Legume Products		
1	Wheat flour, semolina, Fortified flour, Rice	700/-
2	Biscuit, Bread	600/-
3	Cookies	550/-
4	Other Bakery items	500/-
5	Stick noodles	400/-
6	Instant noodles	900/-
7	<i>Dalmoth, Bhujia</i> and other Snacks food	700/-
8	Cereals/Legumes	500/-
08.00 Processed drinking water		
1	Processed drinking water including microbiological tests	2,500/-
09.00 Sweetening Agents		
1	Sugar, Sugar candy	850/-
2	Honey	1,100/-
10.00 Confectionery Products		
1	Chocolate, Toffee, Candy, Lozenges	750/-
2	Chewing gum, Bubble gum	500/-
11.00 Food Preservatives, Additives and Contaminants		

1	Per Heavy metal	550/-
2	More than one Heavy metal group	1,500/-
3	Minerals (Fe, Ca, Mg, Mn, etc.)	250/-
4	Mycotoxins/Total aflatoxins	1,000/-
5	Vitamins	1,000/-
6	Melamine	1,000/-
7	Color qualitative	250/-
8	Color quantitative	700/-
9	Formalin	1,000/-
10	Benzoic acid preservative	400/-
11	Nitrite preservative	400/-
12	Other preservatives/Food additives each	400/-
13	Sulfur dioxide preservative	400/-
14	Pesticide Residues	
	• Organochlorine, Organophosphorus group	2,000/-
	• Other groups/per pesticide	2,000/-
	• Per Pesticide residue	1,000/-
15	Veterinary drug residue per antibiotic each	700/-
16	Veterinary drugs residue in group	2,000/-
17	Monosodium glutamate, MSG	500/-
18	Radiation test by Becquerel Monitor	1,000/-
19	Taurine amino acid	1,000/-
20	Histamine	1,000/-
21	Amino acids profile	2,000/-
22	Fatty acids/Trans fatty acids	2,000/-
23	Antioxidant each	1,000/-
24	Specific gravity	400/-
25	HMF test	1,000/-
26	Caffeine in foods and Beverage	300/-
27	Iodin content	300/-
28	Grayanotoxins including other natural toxins each	1,000/-
12.00 Parameter wise Revenue for Misc. Food Products		
1	Moisture	150/-
2	Protein	300/-

3	Carbohydrate	300/-
4	Sugar	300/-
5	Total solid	300/-
6	Starch qualitative	300/-
7	Crude Fat	300/-
8	Total Ash	200/-
9	Grading per parameter (Cereals, Spices and others)	150/-
10	Acidity	150/-
11	pH	100/-
12	Alkalinity	150/-
13	Crude fiber	400/-
14	Water soluble ash	200/-
15	Acid Insoluble Ash	200/-
16	Alcoholic extract	200/-
17	Salt content	200/-
18	Solubility	150/-
19	Refractive index	200/-
20	Saponification value	200/-
21	Iodine value	200/-
22	Unsaponification matter	300/-
23	Free fatty acid/Acid Value	150/-
24	Peroxide value	200/-
25	Melting point	150/-
26	Sucrose quantitative	800/-
27	Glucose quantitative	800/-
28	Fructose quantitative	800/-
29	Drained weight	100/-
30	Volatile oil	200/-
31	Non-volatile oil	200/-
32	Lead chromate test	100/-
33	Curcumine	250/-
34	Sodium chloride	200/-
35	Organic acid each	800/-
36	RM value	250/-

37	Lactometer verification each	550/-
38	Carbondioxide pressure test	400/-
39	Net weight or volume	100/-
40	Proximate test	1,500/-
41	Antinutritional compound	700/-
42	Color profile test by Chromameter	1,000/-
43	Texture profile test	1,000/-
44	Water activity	500/-
45	Fill of container	100/-
46	Fruit content	400/-
47	Uric acid	500/-
48	Gluten	250/-
For the other parameters, Not listed above, per parameter		400/-
Parameters Analyzed by advanced instruments (GC, LC, ICP-MS, PCR), per parameter		800/-
13.00 Adulteration Test		
1	Hexabromide test	150/-
2	Argemone test	300/-
3	Beliar test	300/-
4	Baoudine test	150/-
5	Lard test, Qualitative	300/-
6	Mineral oil test, Qualitative	300/-
7	Phosphatase test, Qualitative	200/-
8	Methylene blue test	200/-
9	Resaurine test	200/-
10	Bicarbonate test, Qualitative	200/-
11	Glucose test, Qualitative	150/-
12	Starch test, Qualitative	150/-
13	Nonedible color test, Qualitative	300/-
14	Urea test, Qualitative	300/-
15	Neutralizer test, Qualitative	300/-
16	Formalin test by test kit	300/-
17	Pesticide test by test kit	300/-

18	Khesari test, Qualitative	300/-
14.00 Alcoholic Beverages		
1	Wine and Beer quality	2,000/-
2	Liquors, Whiskey, Rum, Vodka, Gin etc.	2,000/-
3	Methyl alcohol, Qualitative	400/-
4	Ethyl alcohol	550/-
5	Methyl alcohol, Qualitative	1,100/-
6	Other each parameter	400/-
15.00 Meat Products		
1	Fresh meat	950/-
16.00 Animal Feeds		
1	Feed products	1,600/-
2	Feed Ingredients	1,500/-
17.00 Microbiological Test		
1	Mold count	250/-
2	Yeast and its spores	250/-
3	Total Bacterial count	250/-
4	Coliform count	300/-
5	Salmonella spp.	500/-
6	Staphylococcus spp.	500/-
7	Clostridium botulinum/perfringes	500/-
8	Streptococcus spp.	300/-
9	Bacillus cereus	300/-
10	Vibrio spp.	300/-
11	Listeria monocytogenes	300/-
12	Nematodes	100/-
13	Other microorganisms each	300/-
14	Swab test	300/-
15	Enterobacterioceae	400/-
16	Microorganism not mentioned in the above list (per parameter)	400/-



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