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&

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SULTANATE OF OMAN

JUNE 2021

PRE-FEASIBILITY REPORT (DRAFT)

FOR

SETTING UP A FOOD TECHNOLOGY TRAINING, TESTING AND DEVELOPMENT CENTER IN OMAN (FTTTDC)

CONTENTS

1.0 INTRODUCTION

This report relates to the study for assessing the techno commercial viability of establishing a Food Technology Training Testing and Development Center (FTTTDC) in Oman.

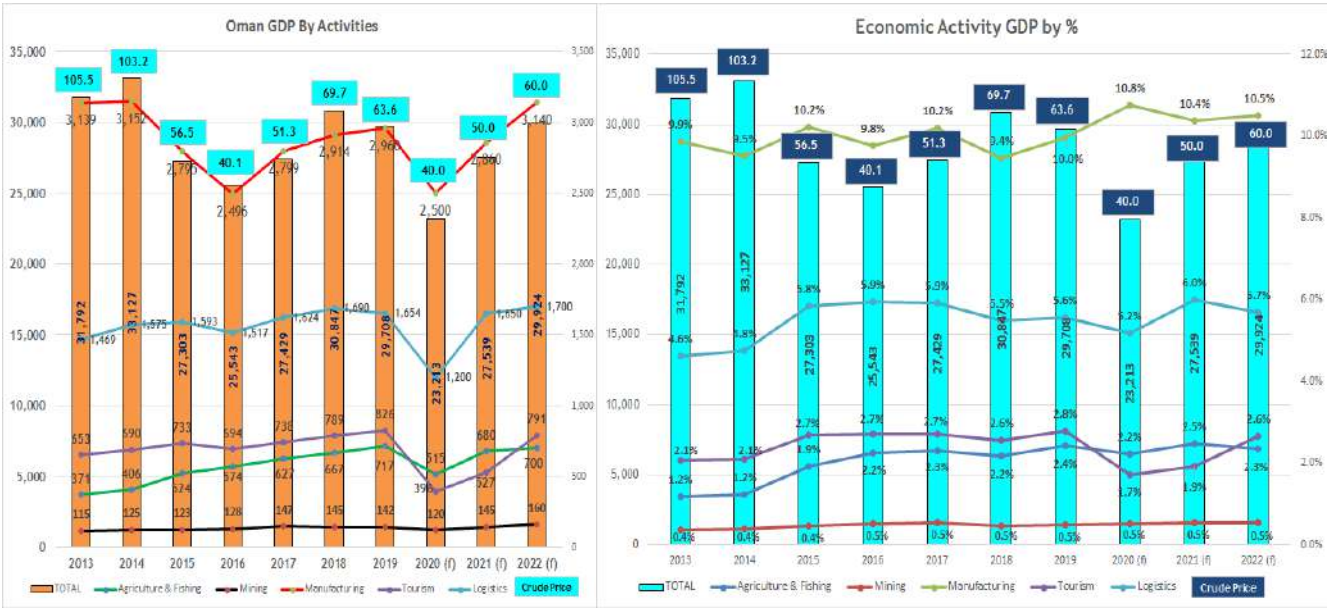
1.1. PROJECT BRIEF

Name of Project		Food Technology Training Testing and Development Center
Total Investment		RO 3,910,000
Equity Investment		RO 1,569,000
Key Appraisal Criteria:		
IRR on total investment		12.2%
IRR on Equity		15.7%
Payback period of Total Investment		6 Years 10 Months
Payback period on equity		7 Years 1 Month
Break Even Point (as % of Capacity)		65%
Cash Break Even Point (as % of Capacity)		56%
Debt Equity Ratio		1.5 : 1
DSCR		2.11
Manpower	Total (in Year 4)	59 (71% Omanisation)

2.0 INDUSTRY ANALYSIS

2.1. MACROECONOMIC CONDITIONS

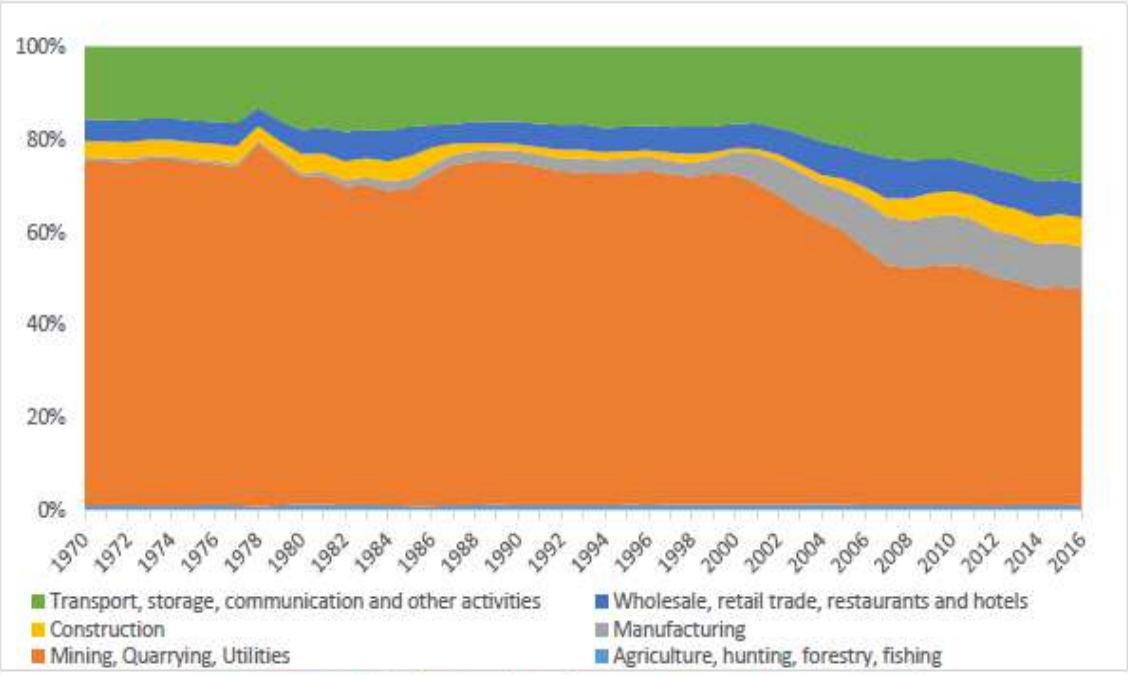
The recently published statistical bulletin from National Centre for Statistics and Information (NCSI) indicates that the GDP at market prices reduced by 15% during Year 2020 when compared to the Year 2019. This is mainly due to the dual impact of slump in oil prices and the COVID – 19 pandemic. As per the World Bank outlook a revival is expected in 2021 and in 2022 on an average of around 4%. The estimated GDP of Oman considering the past trend, current situation and the expected recovery is illustrated below:



The average price of Oil for 2020 is USD 46/Barrel. We expect this to go up to USD 50/barrel in 2021 and USD 60/barrel in 2022.

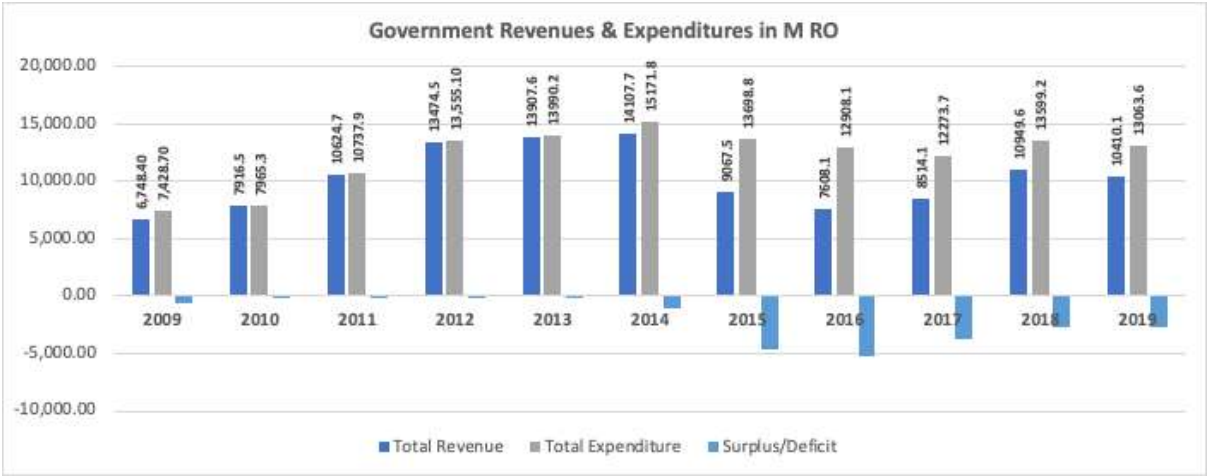
2.2. TREND IN ECONOMIC DIVERSIFICATION

Since the beginning of the millennium our economic activity has significantly moved away from oil as indicated below. The following graph gives data up to 2016. In 2019 Crude Petroleum contributed to 29.11% of GDP.



Source: UNIDO elaboration based on UN Statistics Division (2018)

However the Government income is still substantially dependent on Oil sector. The tightening of spending, introduction of VAT and increased revenues from Gas are expected to contain deficits to manageable levels by 2022.



3.0 FOOD SECTOR IN OMAN

3.1. STATUS OVERVIEW

There are 91 large and medium establishments in the Sultanate in the food sector, as of the year 2017, employing about 12,677 employees. In the beverages sector there are 31 large and medium establishments in the Sultanate, employing about 3,428 employees.

There are 21 joint stock companies, 62 Limited Liability Companies, 4 limited partnership, 1 general partnership and 32 sole proprietorship companies in the food and beverages sector in 2016. It can be inferred that the units vary widely in terms of size, investment as well as management.

In addition to this there are a similar number of units (tiny sector) which do not come under the purview of the MOCI Statistics Department's coverage but are involved with the manufacture of food products. The following detailed analysis is based on the data provided to MOCI by the 122 units in the food and beverages sector.

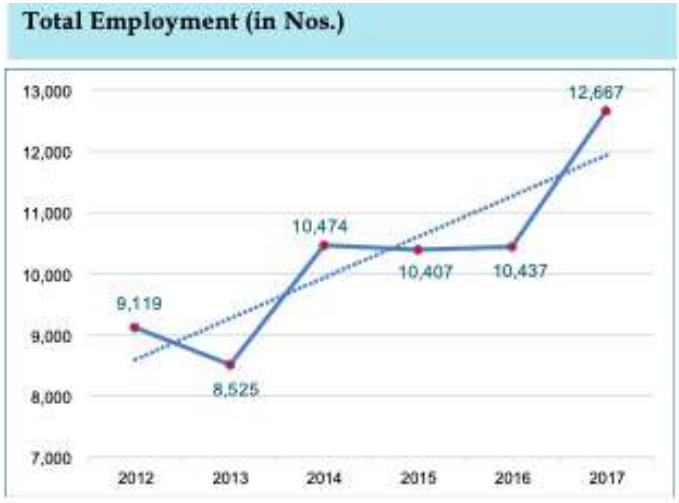
3.2. FOOD SECTOR ANALYSIS

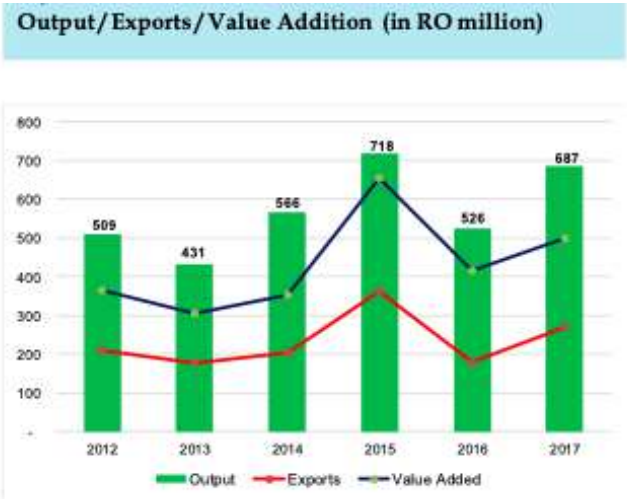
The following sections highlight the key indicators in the food and beverage sector and also the subsectors

3.2.1. Food Sector

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Exports	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)						Rial Omani	
2012	90	9,119	194.7	335.0	254.2	509.3	157.4	208.8	17,263	0.81
2013	80	8,525	157.3	277.5	195.8	430.7	126.3	177.8	14,817	0.80
2014	80	10,474	185.9	379.2	274.6	566.1	148.2	204.8	14,149	0.80
2015	82	10,407	222.6	381.0	298.8	718.3	291.4	362.2	28,005	1.31
2016	89	10,437	169.5	250.2	156.5	525.9	234.4	180.7	22,455	1.38
2017	91	12,667	255.2	394.5	287.2	687.1	229.9	269.7	18,148	0.90

Source: MOCI Industrial Statistics 2018

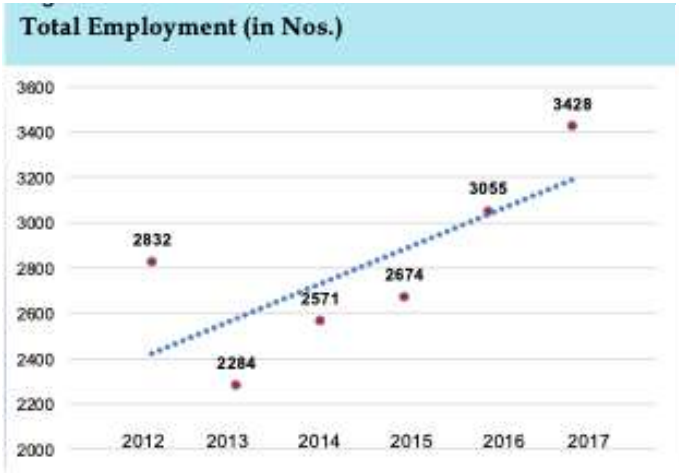




3.2.2. Beverages

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Exports	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)						Rial Omani	
2012	28	2832	26.28	47.88	42.05	100.28	42.48	0.89	14,999	1.62
2013	29	2284	27.13	44.20	40.41	78.75	24.51	1.28	10,730	0.90
2014	24	2571	35.71	50.72	48.25	92.26	27.47	1.10	10,684	0.77
2015	27	2674	126.49	40.45	36.76	90.43	36.61	3.62	13,693	0.29
2016	31	3055	47.33	29.38	9.92	115.65	70.67	0.70	23,134	1.49
2017	31	3428	44.76	33.57	28.04	82.50	33.99	1.67	9,914	0.76

Source: MOCI Industrial Statistics 2018



3.2.3. Meat & Poultry Industry

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	2	812	21.3	16.9	13.1	30.0	12.7	15,665	0.60
2013	1	655	19.0	12.2	10.2	25.9	11.6	17,755	0.61
2014	2	1,078	17.9	19.3	13.4	37.5	15.0	13,948	0.84
2015	2	1,082	31.6	16.5	9.9	40.3	19.3	17,801	0.61
2016	2	1,108	25.1	16.1	10.0	40.9	20.8	18,810	0.83
2017	3	1,326	27.9	17.8	10.5	35.9	13.0	9,813	0.47

Source: MOCI Industrial Statistics 2018

Meat and Poultry Industry - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.2.4. Fish Processing & Preserving

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	15	827	14.4	28.5	5.8	50.5	14.5	17,543	1.01
2013	17	1,011	15.0	27.6	3.0	46.7	15.4	15,185	1.03
2014	14	920	12.6	22.1	1.9	36.9	11.5	12,447	0.91
2015	14	939	12.7	23.9	5.7	38.0	12.4	13,193	0.98
2016	17	858	11.1	31.9	1.2	51.0	13.8	16,061	1.24
2017	16	890	11.8	34.5	1.6	51.8	13.6	15,247	1.15

Source: MOCI Industrial Statistics 2018

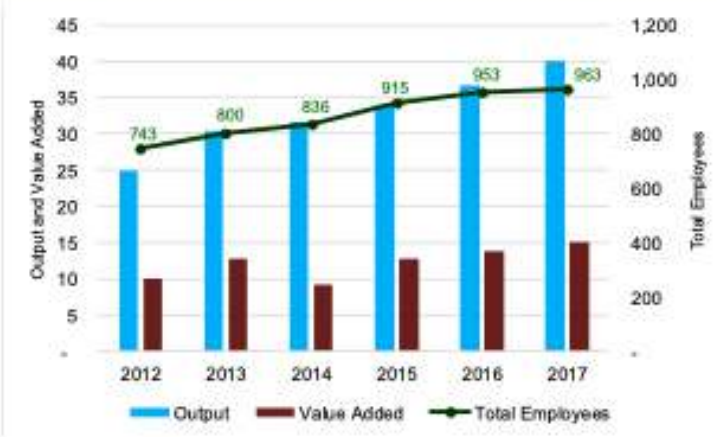
Fish Processing and Preserving - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.2.5. Fruits & Vegetables Processing

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	6	743	9.1	12.6	7.0	24.9	10.0	13,445	1.10
2013	8	800	8.9	14.4	9.5	30.3	12.8	16,026	1.43
2014	6	836	11.5	19.8	11.7	31.7	9.2	10,998	0.80
2015	7	915	13.0	17.7	11.1	34.0	12.8	13,938	0.98
2016	7	953	15.6	18.5	11.0	36.7	13.9	14,539	0.89
2017	7	963	19.0	19.9	12.7	40.0	15.1	15,706	0.79

Source: MOCI Industrial Statistics 2018

Fruits and Vegetable Processing - Total Employment (in Nos.) and Output / Value Addition (in RO million)



3.2.6. Dairy

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	3	435	1.4	5.3	3.8	9.2	2.4	5,517	1.75
2013	3	912	12.1	8.4	7.5	20.7	6.0	6,550	0.49
2014	2	726	10.9	13.5	9.2	20.1	4.8	6,652	0.44
2015	2	780	27.3	6.7	5.4	26.7	17.2	22,001	0.63
2016	2	169	2.8	35.4	30.8	39.7	7.6	44,834	2.70
2017	3	910	21.1	17.1	16.0	40.4	15.0	16,446	0.71

Source: MOCI Industrial Statistics 2018

Dairy - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.2.7. Grains

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	2	607	16.96	70.69	68.95	90.28	27.80	45,801	1.64
2013	1	452	15.99	36.91	36.15	38.94	7.00	15,489	0.44
2014	2	730	29.97	82.24	80.92	105.59	20.46	28,034	0.68
2015	2	799	22.51	69.75	68.28	106.19	21.74	27,215	0.97
2016	2	808	28.56	6.45	5.52	94.37	71.45	88,431	2.50
2017	2	1,013	30.49	65.32	64.18	95.37	28.32	27,954	0.93

Source: MOCI Industrial Statistics 2018

Grains - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.2.8. Bakery Products

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	33	2,525	25.8	21.5	3.6	39.6	14.1	5,587	0.55
2013	27	2,390	28.7	12.1	4.9	35.5	18.6	7,781	0.65
2014	30	3,183	31.7	28.8	9.1	57.4	24.3	7,635	0.77
2015	30	2,927	34.1	28.6	14.7	64.0	30.4	10,379	0.89
2016	32	3,333	29.8	29.9	8.3	73.6	37.5	11,265	1.26
2017	31	2,948	43.4	27.6	11.0	76.5	41.0	13,897	0.95

Source: MOCI Industrial Statistics 2018

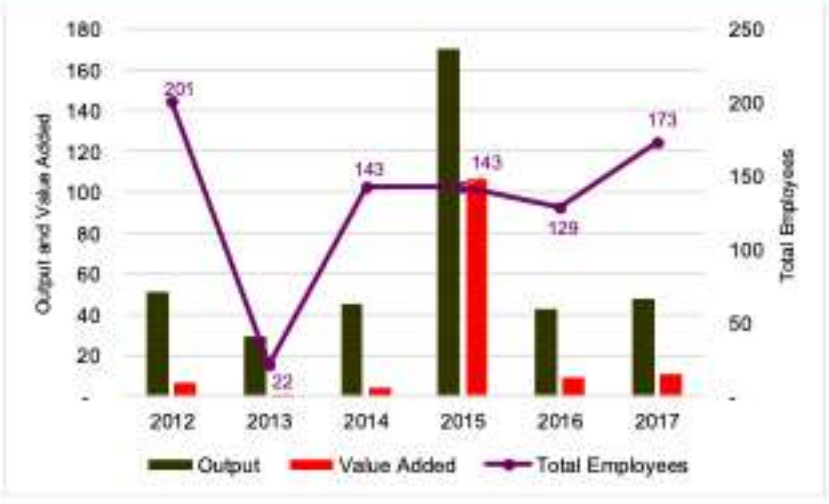
Bakery Products - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.2.9. Animal Feeds

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	4	201	15.7	44.8	41.8	51.4	6.4	31,835	0.41
2013	1	22	2.6	30.3	30.2	29.3	1.0	47,033	0.40
2014	3	143	7.7	36.8	34.5	45.4	3.7	26,178	0.49
2015	3	143	9.4	65.5	63.3	170.3	106.0	741,225	11.31
2016	3	129	8.7	31.7	30.8	42.8	9.0	69,777	1.03
2017	3	173	9.2	35.3	34.8	47.9	11.1	64,433	1.22

Source: MOCI Industrial Statistics 2018

Animal Feeds - Total Employment (in Nos.) and Output / Value Addition (in RO million)



3.2.10. Mineral Water & Soft Drinks

Year	Total Units	Total Employees	Book Value of Fixed Assets (VFA)	Materials	Imported Materials	Output	Value Added (VA)	Labour Efficiency (RO/ Employee)	Capital Efficiency (VA /VFA)
	No.	No.	(RO million)					Rial Omani	
2012	28	2,804	26.3	47.9	42.1	100.3	42.5	15,148	1.62
2013	29	2,248	27.1	44.2	40.4	78.7	24.5	10,902	0.90
2014	24	2,542	35.7	50.7	48.2	92.3	27.5	10,805	0.77
2015	27	2,645	126.5	40.5	36.8	90.4	36.6	13,843	0.29
2016	31	3,039	47.3	29.4	9.9	115.6	70.7	23,255	1.49
2017	31	3,428	44.8	33.6	28.0	82.5	34.0	9,914	0.76

Source: MOCI Industrial Statistics 2018

Mineral Water and Soft Drinks - Total Employment (in Nos.) and Output / Value Addition (in RO million)

3.3. ECONOMIC INDICATORS – FOOD SECTOR (SUMMARY)

The following three indicators have been analysed for understanding the relative importance of food Sector in Oman:

- Gross Output – 2012 to 2017
- Gross value added – 2012 – 2017
- Ratio of value Addition to Finished Goods output – 2012 – 2017

3.3.1. Gross Output – 2012 to 2017

The following table illustrates the value of finished goods during 2012 to 2017 along with the CAGR during this period.

ISIC Code	Industrial Activity	2012	2013	2014	2015	2016	2017	CAGR (2012 - 2017
		(RO million)						
10	Food products	509.3	430.7	566.1	718.3	525.9	687.1	6%
11	Beverages	100.3	78.7	92.3	90.4	115.6	82.5	-4%
13	Textiles	20.8	10.2	16.0	18.4	15.3	15.5	-6%
14	Wearing Apparel	5.3	2.3	5.0	4.3	3.7	26.5	38%
15	Leather	2.4	2.6	2.9	3.3	6.6	3.7	9%
16	Wood Products	33.9	75.1	110.2	88.3	136.1	138.7	33%
17	Paper and Paper Products	31.5	22.0	33.2	30.8	33.2	50.7	10%
18	Printing	60.5	44.7	44.5	58.5	40.7	41.7	-7%
19	Coke and Refined Petroleum Products	2,224.1	4,148.6	5,810.7	2,915.0	2,747.1	2,764.1	4%
20	Chemicals and Chemical Products	2,344.9	793.8	664.6	668.8	627.1	688.7	-22%
21	Pharmaceuticals, Medicinal Chemicals, etc.	32.5	24.1	11.2	7.7	27.7	41.7	5%
22	Plastics	137.9	156.6	180.6	213.8	176.8	220.9	10%
23	Other non-metallic mineral products	720.2	576.8	595.2	692.9	630.8	696.7	-1%
24	Basic metals	1,077.0	995.3	946.8	937.8	996.9	1,141.3	1%
25	Fabricated Metal Products	233.2	363.4	479.0	551.1	563.5	643.5	23%
26	Computer, Electronic & Optical Products	44.8	46.0	45.1	34.6	37.3	57.0	5%
27	Electrical Equipment	471.9	444.0	435.5	543.4	433.4	457.9	-1%
28	Machinery and Equipment n.e.c.	40.8	56.9	69.9	60.7	54.8	61.0	8%
29	Motor Vehicles	8.0	6.6	6.6	7.4	7.3	7.5	-1%

ISIC Code	Industrial Activity	2012	2013	2014	2015	2016	2017	CAGR (2012 - 2017
		(RO million)						
30	Other Transport Equipment	2.4	1.3	30.5	17.3	31.0	34.6	70%
31	Furniture	53.4	48.1	37.6	45.5	38.7	58.0	2%
32	Other Manufacturing	11.7	0.4	14.8	19.3	17.4	9.7	-4%
33	Repair and installation of Machineries	83.3	56.0	29.2	39.2	38.2	44.1	-12%
	Total	**8,250.1**	**8,384.4**	**10,227.4**	**7,766.7**	**7,305.4**	**7,973.3**	**-1%**

Source: MOCI Industrial Statistics 2018

Analysis indicates that:

- Food & Beverage sector had a total value of 770 million is one of the largest contributor in the gross output
- The Food sector with a sustained CAGR of about 6% over the past 6 years, is one of the key contributors to the economy.

3.3.2. Gross Value Added – 2012 to 2017

The following table illustrates the Gross value Added during 2012 to 2017 along with the CAGR during this period.

ISIC Code	Industrial Activity	2012	2013	2014	2015	2016	2017	CAGR (2012 - 2017
		(RO million)						
10	Food products	157.4	126.3	148.2	291.4	234.4	229.9	8%
11	Beverages	42.5	24.5	27.5	36.6	70.7	34.0	-4%
13	Textiles	8.0	3.8	6.0	6.3	6.0	6.2	-5%
14	Wearing Apparel	2.2	1.3	3.3	2.3	1.7	21.2	57%
15	Leather	1.1	0.8	0.9	1.4	4.4	1.4	5%
16	Wood Products	15.0	23.6	37.7	65.5	47.6	50.8	28%
17	Paper and Paper Products	7.8	6.5	11.1	10.3	12.1	18.6	19%
18	Printing	39.5	21.3	21.3	36.5	20.9	25.6	-8%
19	Coke and Refined Petroleum Products	653.3	791.3	1,336.5	1,028.8	578.2	700.3	1%
20	Chemicals and Chemical Products	1,377.7	519.3	403.3	412.5	357.6	371.6	-23%
21	Pharmaceuticals, Medicinal Chemicals, etc.	16.0	11.8	4.9	2.9	14.9	16.0	0%
22	Plastics	40.4	44.3	53.7	95.8	73.2	107.4	22%
23	Other non-metallic mineral products	329.1	331.2	325.1	383.6	315.4	391.0	4%

ISIC Code	Industrial Activity	2012	2013	2014	2015	2016	2017	CAGR (2012 - 2017
		(RO million)						
24	Basic metals	377.1	457.2	382.0	363.5	376.6	398.8	1%
25	Fabricated Metal Products	105.0	168.6	221.5	304.8	269.3	347.3	27%
26	Computer, Electronic & Optical Products	15.9	16.9	10.7	8.2	8.4	11.3	-7%
27	Electrical Equipment	170.2	152.4	149.5	177.4	104.9	128.6	-5%
28	Machinery and Equipment n.e.c.	24.0	34.0	44.3	49.7	40.3	34.5	7%
29	Motor Vehicles	3.0	2.6	2.5	3.0	5.8	6.4	16%
30	Other Transport Equipment	0.9	(6.8)	14.7	12.2	12.7	14.3	73%
31	Furniture	24.9	24.2	18.8	23.4	22.8	26.2	1%
32	Other Manufacturing	2.6	0.2	4.6	6.6	6.1	7.2	23%
33	Repair and installation of Machineries	75.2	50.6	26.0	35.7	28.3	33.1	-15%
	Total	**3,488.7**	**2,805.6**	**3,254.3**	**3,358.4**	**2,612.4**	**2,982.0**	**-3%**

Source: MOCI Industrial Statistics 2018

Food & Beverage Sector ranks fifth in terms of gross value addition contributing approximately RO 263.9 million in 2017.

3.3.3. Gross Value Addition to Output - 2017

The following table illustrates the % Gross value Addition to the Gross Output, during 2017.

ISIC Code	Industrial Activity	Value Addition (VA)	Output	VA / Output
		(RO million)		(%)
10	Food products	229.9	687.1	33.5%
11	Beverages	34.0	82.5	41.2%
13	Textiles	6.2	15.5	40.2%
14	Wearing Apparel	21.2	26.5	80.1%
15	Leather	1.4	3.7	38.3%
16	Wood Products	50.8	138.7	36.7%
17	Paper and Paper Products	18.6	50.7	36.7%
18	Printing	25.6	41.7	61.5%
19	Coke and Refined Petroleum Products	700.3	2,764.1	25.3%
20	Chemicals and Chemical Products	371.6	688.7	54.0%
21	Pharmaceuticals, Medicinal Chemicals, etc.	16.0	41.7	38.4%
22	Plastics	107.4	220.9	48.6%
23	Other non-metallic mineral products	391.0	696.7	56.1%
24	Basic metals	398.8	1,141.3	34.9%

25	Fabricated Metal Products	347.3	643.5	54.0%
26	Computer, Electronic and Optical Products	11.3	57.0	19.8%
27	Electrical Equipment	128.6	457.9	28.1%
28	Machinery and Equipment n.e.c.	34.5	61.0	56.6%
29	Motor Vehicles	6.4	7.5	84.8%
30	Other Transport Equipment	14.3	34.6	41.4%
31	Furniture	26.2	58.0	45.2%
32	Other Manufacturing	7.2	9.7	74.5%
33	Repair and installation of Machineries	33.1	44.1	75.2%
	Total	**2,982.0**	**7,973.3**	**37.4%**

Source: MOCI Industrial Statistics 2018

The value addition is 33.5% in the food sector and 41.2% in the beverages sector. The value addition of the food sector is much less than the industrial average of 48%.

3.4. STRUCTURE OF THE INDUSTRY IN OMAN

3.4.1. Products Manufactured

The following table illustrates the different types of food products manufactured in the Sultanate and the number units manufacturing them.

Sl.No	Product - Sub Sector	No. of Units
		2017
1	Meat and Edible offal of poultry	3
2	Fish / Fish Fillet& Marine products	16
3	Fruits & Vegetables Processing	7
4	Dairy	3
5	Grains	2
6	Bakery Products	31
7	Animal Feeds	3
8	Mineral Water & Soft Drinks	31
9	Others	26
	Total	**122**

Source: MOCI Data

Out of the 122 units 31 are bakeries, 31 are mineral water & soft Drinks units and 16 units are in fisheries sector.

3.4.2. Unit Size – Based on Total Employment

The following table illustrates the size of the unit based on the employment levels for the year 2016. As it can be seen about half of the total number of units employs less than 50 employees. The data for 2017 is not available,

Employee Strength	No. of Units	
	2016	Cumulative %
10 to 19	31	26%
20 to 49	45	63%
50 to 99	11	73%
100 to 499	26	94%
500 and above	7	100%
Total	**120**	

Source: MOCI Data

In addition the table below illustrates that almost 80% of the employees work in large firms having over 100 employees.

Employee Strength	Nos. employed in 2016	2016 - % of Total
Less than 20	457	3%
20 to 49	1,321	10%
50 to 99	775	6%
100 to 499	5,959	44%
500 and above	4,980	37%
Total	**13,492**	

These two tables clearly indicate that the though there are limited medium (26 units having employment in the range of 100 to 500) and large units (7 units having employment over 500), they contribute to over 80% of the employment.

3.5. GROSS OUTPUT VALUE (2012 - 2017)

The following table illustrates the gross output in RO million by the different food processing units during 2012 to 2017

ISIC	DESCRIPTION	Gross Output Value (in RO Million)						
		2012	2013	2014	2015	2016	2017	CAGR
1010	Processing/preserving of meat	30.0	25.9	37.5	40.3	40.9	35.9	4%
1020	Processing/preserving of fish, etc.	50.5	46.7	36.9	38.0	51.0	51.8	0%
1030	Processing/preserving of fruit, vegetables	24.9	30.3	31.7	34.0	36.7	40.0	10%
1040	Vegetable and animal oils and fats	105.4	91.8	105.7	105.0	28.8	165.5	9%
1050	Dairy products	9.2	20.7	20.1	26.7	39.7	40.4	34%
1061	Grain mill products	88.0	35.7	102.0	102.8	91.0	91.2	1%
1062	Starches and starch products	2.3	3.2	3.5	3.4	3.3	4.1	13%
1071	Bakery products	39.6	35.5	57.4	64.0	73.6	76.5	14%
1073	Cocoa, chocolate and sugar confectionery	10.8	0.0	10.1	11.0	10.6	10.9	0%
1074	Macaroni, noodles, couscous, etc.	19.7	19.7	20.3	17.8	9.3	11.0	-11%
1075	Prepared meals and dishes	1.7	2.1	1.7	1.9	1.8	1.8	1%
1079	Other food products n.e.c.	75.7	89.9	93.6	103.1	96.3	109.9	8%
1080	Prepared animal feeds	51.4	29.3	45.4	170.3	42.8	47.9	-1%
1104	Soft drinks, mineral waters, other bottled waters	100.3	78.7	92.3	90.4	115.6	82.5	-4%
	Total	**609.6**	**509.5**	**658.3**	**808.7**	**641.6**	**769.6**	**5%**

Source: MOCI Data

- Food sector shipments and revenue (other than commissions) has registered a compounded annual growth rate of about 5% during the years 2012 to 2017.
- While all the segments of the industry have shown growth trends, the growth in the shipment value of dairy and bakery products have been impressive.

3.6. TECHNOLOGY ASSESSMENT OF SUB-SECTORS

The spectrum of technologies employed in Oman in most cases is limited and offers immense scope for modernization and up gradation. Lack of adequate quality control facilities, certifications (ISO, HACCP etc) and trained personnel is the current setback faced by the industry. Hence focus should be on strengthening existing infrastructure as well as capacity building and training the manpower. This would help the manufacturing units scale up operations and adopt world class manufacturing practices. This in the long run would pave way for improving their competitiveness in addition to developing / diversification to new areas / products.

3.6.1. Milling & Bakery

Bakery and confectionery products are produced from the dough prepared with flours of cereals and legumes where starch is the basic major component.

Aestivum wheat is used for bakery products and Durum is used for pasta products. In Oman there are two roller flour mills processing 1,100 tonnes of wheat per day. The wheat is also processed into whole wheat flour for using in the preparation of traditional products.

Suggestions for milling and baking industries in Oman include:

- Automation of the milling and bakery industries to improve the productivity and quality of milled products to enable to compete in the markets of GCC and other countries.
- Introduction of online quality control for the manufacture of consistent quality products.
- Meeting the specifications of downstream bakery industries.
- Harmonization of standards and specifications with international and GCC requirements to compete in the external market.

- Diversification of production with introduction of specific flours targeting the different bakery industries to meet the production needs of bread, cookies, cake, pizza etc.
- Improving the nutritional quality of milled products with the addition of vitamins and minerals.
- Setting up quality control facilities to meet the safety and regulatory requirements
- Harmonization of specifications and standards with international specifications and standards
- Implementation of HACCP/ISO quality systems
- Training of staff to improve productivity and quality
- Diversification of products for optimum utilization of the production capacities
- Introduction of newer products with health and nutritional benefits
- Newer products that can be considered by baking industry are products with functional ingredients, low sodium products, high fibre products, sugar free products, low calorie products/low carbohydrate products. The functional ingredients that can be used are herbs, spices, isoflavones and saponins from soy, anti-oxidants from various sources, omega three fatty acids from fish and flax seeds and fibres from cereals.
- The health concerns of consumers can be addressed with introduction of soy based bread, flax seed bread, fat free and sugar free breads.
- Frozen dough and frozen fresh baked bread are the expanding market as it ensures high level of quality.
- Bite sized bakery products are the new innovation. Whole grain based bakery products are gaining popularity as these are aimed at weight reduction and improved health.
- The organic products market is experiencing rapid growth as products like organic cereals, bread, pizza and cookies have entered the market. Even organic wheat flour has made its entry into the market.

- Future strategies for the baking industry have to be development of brand, co-branding, production of age specific products, indulgent products, health oriented products, organic products, variety of flavours and packaging materials and design.

3.6.2. Fishery Sector

The Sultanate of Oman with 1,700 Km long coastline extending from Musandam Peninsula at the entrance of the Gulf in the north to the border with Yemen Republic in South has extremely rich fishing grounds, the potential of which has yet to be fully evaluated.

The product mix of the existing units are mainly are fresh fish, frozen fish and canned fish. Most of these are exported. However it has to be noted that most of the exports are frozen fish resulting lower per unit realizations. The strategy for exports has to be focused on selling of fresh fish; value added products and developing aquaculture projects to cater to the growing requirements of the GCC as well as the world markets. The potential for the same has been illustrated in the world as well as the GCC fisheries sector analysis. The EU approval of most of the units should be leveraged in this respect

Besides, there is a need to adapt processed fish products of various types to Omani preferences, which require a detailed understanding of the Omani palate and the role played by texture, mouth feel, sensory and other related characteristics in making these products appealing to the consumers. Oman fisheries with their existing manufacturing plant in Buraymi can venture into this area.

Besides introduction of new products in the market, standardization of various factors such as bacteriological standards, preservation standards, additives, heavy metals such as mercury, histamine, pesticide residues, etc., of fish and fish based products is required.

3.6.3. Meat and Poultry Sector

Meat and Poultry sector in Oman is totally dependent on import of raw materials and semi-finished products. The major product mix manufactured by these companies are meat cuts, meat burger, meat mince, beef and chicken frozen, brown and white eggs, dressed chicken, fresh chilled chicken, frozen cut up parts, thigh/breast of chicken, etc.

The industry as a whole needs forward and backward integration. This is essential in order to reduce total dependency on imports. The industry may also look into product diversification possibilities, value addition and introduction of novel products to cater to both Omani and expatriate sector for domestic market.

The meat and poultry industry must ensure that their products should meet the safety and regulatory requirements. Implementation of HACCP/ISO quality systems are also be given priority by the industry. Poultry products are randomly tested for salmonella. Omani guidelines allow for a maximum tolerance of salmonella in 20% of the samples tested. These guidelines are to be revised to ensure the absence of salmonella in all the products tested. Standardisation of various factors such as bacteriological standards, preservation standards, additives, pesticide residues, etc., of meat and meat based products is required.

Skill development and training of staff to improve productivity and quality should also be actively looked into for the development of the sector.

3.6.4. Agriculture Sector

Except dates, industries dependent on local agricultural resources are non-existent. Date palm cultivation is very important in Oman with the commercial product coming into two forms – fresh and dry. Although the local market is the most important buying outlet, exports have been rising and food industry appreciates the enormous potential of the export sector. It is very vital to

address the issues in harvesting, transportation, storage, packaging and marketing of dates. As large varieties of dates are grown, there is a need for evaluation of the dates for varietals suitability into various processed products, besides proximate composition, textural as well as sensory attributes.

Insect infestation in date is also an issue to be addressed by the industry. Protocols for fumigation of dates and training in fumigation techniques are the requirements of the industry. The existing date processing units have excellent potential to produce various value added products such as:

- Omani sweets/Arabic sweets incorporating date puree/paste as a sweetening agent, Product standardisation is required
- Crunchy fruit bar based on date pulp including fibre or date syrup concentrate incorporating other ingredients, as a source of high energy and protein nourishment for high altitude and remote area ration for armed personnel
- Fruit cereal flakes containing date pulp/syrup/concentrate to be used as a beverage/shake or breakfast food
- Fruit spreads and marmalades based on date syrup
- Candied dates
- Date and honey based health drinks

Besides dates, the other raw materials grown are limes, bananas, tomatoes, onions, carrots, aubergines in Batinah plain and Hajar Mountains. On the coastal plain around Salalah, coconut, banana and papaya fruits are grown. Following are the possibilities based on these:

- Lime - Squash, cordial, lime-barley water, Extension of shelf life of fresh limes, Lime juice concentrate, Pectin extraction from lime peels
- Banana - Extension of shelf life of banana (banana packing unit), Protocols for export, Banana juice clarified, Banana fruit bar, Dehydrated banana

- Tomatoes - Ketchup, sauce, Puree/paste/concentrate, Minimally processed tomatoes, Dehydrated tomato, Tomato powder, Tomato juice – sweet/spicy
- Carrots - Carrot juice, Minimally processed carrot, Dehydrated carrot, Carrot sauce, Carrot candy
- Papaya - Candy/tutti-fruity, Papaya jelly, Papaya fruit bar, Papaya pulp/ puree/concentrate, Papain from papaya latex
- Coconut - Preserved coconut water, Desiccated coconut, Coconut vinegar, Coconut milk, Virgin coconut oil, Coconut jam/spread, Coconut milk powder, Coconut oil extraction, By products – coconut shell powder, coconut coir

3.6.5. Packaging Needs

To cater to international market and GCC markets and to ensure the quality and safety of food with fewer or no additives and preservatives novel packaging technologies are required:

- Packaging films that offer optimal barrier properties for extension of shelf life
- Modified and controlled atmosphere packaging in the international processed food market
- Active and intelligent packaging system, which can monitor product quality, so that the products meet the requisite food safety standards.

3.6.6. Key Inferences from Unit Level Analysis

Following are the general observations about the food sector in Oman. The study also has provided detailed unit level interventions that are discussed in detail in the main report.

- Most of the units involved in the manufacture of the chips, biscuits and wheat flour have a state of art plant set-up, wherein the equipment and technology have been sourced from the global leaders in the field.

- Though most of units involved in the manufacture of ketchup, vegetable oil, dates and eggs employ contemporary technology, quality control process is not up to the mark.
- Most of the manufacturers of milk, poultry meat and juice manufacturing units need to revamp their standards / technology / QC process. An effort towards ISO certification is recommended.
- Units involved in manufacture of products like rice, tea, chocolates etc. have well equipped and efficient set-up and technology is sourced from global leaders. Hence though the product quality is good there are other inherent issues that have restricted the growth of these products.

3.7. PROSPECTS FOR FURTHER INVESTMENTS

Scope for the development of the sector emerges from the following areas:

- Expansion / new projects for manufacturing similar range of products as the existing manufacturers to cater to the growing market needs of the local as well as export markets.
- New / Expansion Projects based on
  - Addition of innovative / value added product lines by the existing manufacturers
  - Forward / Backward Integration possibilities.
  - New projects aimed at effective utilisation of the local agricultural produce

3.7.1. Expansion Possibilities for Existing product Lines

The potential for expansion possibilities of various existing product segments is illustrated below:

- **Bread and other Bakery products:** Cursory analysis indicates the potential for a large sized industrial bakery in the country. The focus should be to cater to the requirements of the institutional segment as well as limited exports to UAE to sustain the required volumes.

- **Chocolates:** Considering the limited size of the local market and the spare capacity available with the local manufacturer, projects looking at the export markets of Africa / Yemen as well as units with potential for label manufacturing can be established.
- **Dates (Branded):** While the industry is still unorganized employing appropriate technology government support to these units by promoting Omani dates / Omani brands would help in the expansion of the local units. Addition of Innovative and value added products would be the basis of expansion of this industry.
- **Fish:** The industry is faced with sliding supplies from the Omani waters. In addition to dwindling fish supplies even the largest player in the organized sector does not have a recognized brand name to leverage up on. The local industry has to shift to export of fresh fish, building of brands and making available high contribution branded Omani fish and other value added products in the international markets. In addition with lower catch from the Omani waters the government should take steps to identify locations and promote inland farming of high priced fish varieties like Shrimps.
- **Juices:** Most of the Juice products that are available in the market are reconstituted juices. The products are undergoing technological innovations especially in the area of packaging and improving shelf life. Though prospects for new projects in the sector are remote, possibility of technology up-gradation does exist.
- **Poultry Meat:** The local companies have a competitive advantage in servicing fresh poultry meat segment. With a large manufacturer having entered the market two years back the scope for large scale units is limited. However a closer analysis of the sector indicates potential for developing many value added products.

3.7.2. Addition of innovative / value added product lines

There exists enough potential for the industry to move into the phase of "offering consumer centric products" by capturing the high demand for high-value foods (meat & seafood, dairy, etc). The industry should take advantage of the natural resources available and production capacity (fish, bakery, beverages, meat and meat products etc) by introducing newer / extended product line.

Following are the new project opportunities in the food sector in Oman:

- Industrial Bakery
- Value added ready to eat fish products
- Minimally processed vegetables
- Cold storage of fruits & vegetables
- Dehydrated vegetables
- Egg coating & washing
- Fruit spreads
- Instant mixes
- Sausages
- Poultry Offals for Ensilaging
- Value added Date products
- Value added ready to eat chicken and egg products
- Banana based products
- Coconut Milk powder
- Dehydrated banana
- Desiccated coconut
- Fish meal and oil
- Papaya tutti fruiti
- Meat wafers

3.8. GOVERNMENT INITIATIVES & RECENT INDUSTRY DEVELOPMENTS

The Oman Food Investment Holding Company (OFIC), the food sector investment arm of the Omani government, is investing in projects including dairy & milk processing, poultry farming & white meat processing, red meat production, camel milk and dates marketing, with the aim to further strengthen the Sultanate's strategic food security goals.

3.9. OMANISATION IN FOOD SECTOR & BEVERAGE SECTOR

The total manpower employed in the food processing industries and Beverages in Oman as at the end of year 2016 is 10,436 and 3056 respectively. The Omanisation level in food sector is at 31% as at the end of year 2016 and 35% for the beverages sector.

Category of Employment	2012	2016
Food Sector		
Total Employment	9,120	10,436
Omani Employment	1,640	1,772
% Omanisation	36%	31%
Beverage Sector		
Total Employment	2,831	3,056
Omani Employment	977	1,062
% Omanisation	35%	35%

Source: MOCI Data

The breakup of Omani Employment into the different categories of employment for the food and beverages sector is presented in the table below:

Category of Employment	Omani Employment in 2016	
	Food Sector	**Beverages**
Managers	58	35
Professionals	65	39
Technicians	104	62
Clerks	121	72
Salesmen	506	303
Craftsmen	114	69
Operators	269	161
Helpers	534	320
Total	**1,772**	**1,062**

Source: MOCI Data

The analysis indicates the following:

- The overall Omanisation level of 35% can be further improved by proper training and other Human Resources Development measures.
- Most of the Omanis are employed as sales men or elementary workers or low skilled operators concerted efforts should be taken to improve the level of Quality Omanisation in the other categories.
- It has also to be noted that the average remuneration is RO 325/month.
- The development of qualified technicians to work as skilled machine operators would help in improving the earning power of the local employees.

3.10. TRAINING FOR QUALITY OMANISATION

There is a lack of trained as well as technically qualified Omanis in food processing sector and thus the immediate need to train the local Omanis in skill development, specific to the sector.

- The existing industries could depute Omani's to agencies like CFTRI, Mysore, India for short term training courses. The courses should be tailor made to address their skill up-gradation requirements. These courses are normally of two to four weeks' duration.
- Courses require to be customized for small scale players who require training on latest hygiene practices, product quality improvement, etc.
- The proposed centre (FTTTDC), once established, will act as centre where these training programs could be effectively be developed and conducted inside the country with focus on participants from the entire GCC region.

3.11. FOOD IMPORTS & RELATED TESTING ISSUES

3.11.1. Food imports into the Sultanate

Imports						
Section / Chapter	2016		2017		2018	
	RO Million	000 Tons	RO Million	000 Tons	RO Million	000 Tons
Live Animals and Animal products	433	573	451	563	500	614
Vegetable Products	321	1,798	370	2,028	406	2,098
Animal or Vegetable fats and Oils	190	921	90	300	87	284
Prepared food stuffs and Beverages	451	1,077	482	1,131	486	1,145
Total	**1,394**	**4,369**	**1,393**	**4,022**	**1,479**	**4,142**

Source: NCSI Statistics 2019

As it can be seen from the above figures the total imports are over RO 1.479 billion.

3.11.2. Testing of Imported Products

It has to be noted that, while the existing testing mechanism (government) is active to a limited extent with respect to local manufacture, according the industrial sources is virtually non-existent for the imported products. The local industry feels that while the local products adhere to the required standards, the non-checking of imported products may lead to sub-standard products being made available to customers resulting in not only unfair competition for them but also resulting in the consumers getting an inferior product.

So, the industry feels that the Government should take the necessary initiative in this regard to continuously monitor the imported food products in addition to auditing the local manufacturers to protect the local industry as well as ensure consumer protection.

4.0 FOOD SAFETY AND RELATED ISSUES

4.1. FOOD SAFETY, QUALITY STANDARDS AND HYGIENE

Food safety and hygiene are very vital in Nation's economy to provide assurance about the safety and quality, and to protect health and safety to the citizens. With the advent of the Sanitary and Phytosanitary (SPS) agreement under WTO and increase in World Food Trade, food safety measures are critical in enabling countries to assure the safety and quality of the foods entering international trade.

Consumers are now taking more interest in the way the food is produced, processed and marketed. The challenges for food control authorities include:

- Increasing burden of food borne illness
- Rapidly changing technologies in food production, processing and marketing
- Developing scientific food control system
- International food trade and need for harmonization of food safety and quality standards
- Growing consumer awareness of food safety and quality issues and increasing demand for better information

The specific concerns about food hazards requiring focus are:

- Microbiological hazards
- Pesticide residues
- Misuse of food additives
- Chemical contaminants like metals, toxins, etc.
- Adulteration

4.2. REQUIREMENTS FOR NATIONAL FOOD CONTROL SYSTEM

Food control systems should cover all food produced, processed and marketed within the country, including imported food. Such systems should have a statutory basis and be mandatory in nature.

Typically, the food control systems will comprise the following components:

4.2.1. Food Laws and Regulations

The development of relevant and enforceable food laws and regulations is an essential component of modern food control system. Food legislation should include the following aspects:

- It must provide high level of health protection;
- It should include clear definitions to increase consistency and legal security
- It should be based on high quality, transparent and independent scientific advice following risk analysis;
- It should provide for tracing of food products and for their recall in case of problems;
- It should include clear provisions indicating that primary responsibilities for food safety and quality rests with producers and processors
- It should also recognize the country's international obligations particularly in relation to trade; and
- It should ensure transparency in the development of food laws and access to information.

4.2.2. Food Control Management

Effective food control systems require policy and coordination at the national level.

- Establishment of regulatory measures
- Monitoring system performance
- Continuous improvements
- Policy guidance

4.2.2.1. Inspection Services

- The Food Inspector is the key functionary and success of the control system depends on his integrity and skill. The responsibilities include:
- Inspecting premises and processes for compliance with hygiene and other requirements of standards
- Evaluating HACCP plan and other implementation
- Carrying out inspection, sampling and certification of food for domestic/import/export.

4.2.2.2. Laboratory Services

Laboratories are an essential component of a food control system. The samples received from Food Inspectors are analysed on the provisions under the relevant rules of the food laws. The laboratories should have adequate facilities for physical, microbiological and chemical analysis. They are to be equipped with sophisticated instruments, apparatus and library facilities.

4.2.2.3. Training

Training of Food Inspectors and analysts, and consumers is very important criteria for the success of the Food Control System.

4.3. FOOD LEGISLATION IN OMAN – CURRENT SCENARIO

The Directorate General for Specifications and Measurements (D.G.S.M) under the Ministry of Commerce and Industry is looking after the activities of consumer protection, consumer guidance and protection of health, safety & quality of life of population in Oman. Following are the key issues with respect to food legislation in Oman:

4.3.1. Lack of Coordination

DGSM under the Ministry of Commerce and Industry is the principal agency dealing with food laws standard and specifications. In addition, the following agencies are involved with the food standards:

- Directorate General of Specifications and Measurements - Ministry of Commerce and Industry
- Directorate General of Health Control - Ministry of Regional Municipalities, Environment and Water Resources
- Ministry of Agriculture and Fisheries

The above organisations/departments work independently of each other and there is no coordination between them. The resultant is the processors/exporters are facing problems.

4.3.2. Lack of Quality Systems

The following quality systems are lacking:

- Omani Quality Mark (certification mark) like Indian Standards under Bureau of Indian Standards Act (BIS)
- National Quality System ISO:9001-2000
- National Environmental Management System ISO:14001-2004
- National Laboratory Accreditation System like National Accreditation Board for testing and calibration laboratories in Oman ISO:17025-2005 (NABL)

4.3.3. Exclusion of products

Though Oman standards for foodstuff products are mandatory, there are many foodstuffs and food commodities not included in the standards. E.g., there are no standards/specifications for rice, although rice is an important staple food in Oman. As per Article (1) of Health Regulation, a municipal licence shall be obtained from the concerned municipality before operation for the above categories.

4.4. FOOD SAFETY LEGISLATION – WAY FORWARD

Developing detailed and effective food safety legislation as a part of the national food policy would benefit all the stake holders of the sector. There are many critical aspects of designing and implementing the food safety legislation. The major areas that need careful evaluation include the following:

4.4.1. Legislation

There is a need for an "Oman Food Safety and Standards Act" to consolidate existing laws relating to food covering different ministries and departments under one umbrella. Besides, development of integrated food law, there is also a need to harmonise with Codex standards.

4.4.2. Food Testing & Standardisation Initiatives

Since a large volume of food raw materials are imported into Oman, there is an immediate need to set up a food safety evaluation facility, which should include testing for:

- Mycotoxins
- Antibiotic residues
- Toxic metals
- Pesticide residues
- Allergens
- Microbial pathogen
- Improved analytical techniques for high precision

In addition, with increased international trade of Genetically Modified foods, a Genetically Modified Foods Laboratory, to monitor the import of GM Foods is also imperative.

4.4.3. Training of Inspection Staff

The training of Food Inspectors should be made mandatory. They should be trained in GMP, GHP and HACCP.

Public awareness is a vital requirement for constructive interaction and sensible encouragement for the healthy development of any industry. MOCI/MRM may initiate public awareness programmes on food safety.

5.0 RATIONALE FOR ESTABLISHING FTTTDC

Based on the detailed food sector study, the following are assessed as the critical needs of the sector that have to be addressed, for strengthening and developing the sector:

5.1. HUMAN RESOURCE DEVELOPMENT INITIATIVES

As discussed in the earlier section, there is ample scope for "Quality Omanisation" in the sector. The efforts have to be focused on the training of the existing manpower in the sector as well as injecting trained Omanis into the sector. The following are the two possible HRD initiatives that can be taken up by FTTTDC:

- Conducting skill and technology up gradation courses for the operating & supervisory personnel from the existing Food Industries.
- Fresh Human Resources need to be developed with specific focus on technical training in various sub-disciplines of food processing technology i.e. food processing techniques, plant biotechnology & genetic engineering, HPLC, fumigation & prophylaxis & pest management techniques, basics of flour milling, packaging of food products.

5.2. PRODUCT TESTING SUPPORT TO INDUSTRY

The Value of finished goods for the year 2017 is over RO 2,982 million. The contribution has come from 122 manufacturing units which produce a variety of food products. It has to be noted that this value does not include small manufacturers employing less than 9 persons.

In addition, there is a huge quantity of food imports into the sultanate through dealers / importers. The testing facility would help them to assess the quality of material that they are buying.

So, it is imperative that internationally accredited Food related Testing laboratory would go a long way in improving the competitiveness of the local industry in assessing their technology status in terms of achieving and maintaining quality. It would also help the trade in establishing their purchase requirements.

5.3. CONSULTING AND OTHER SUPPORT TO INDUSTRY

The analysis of the different sub-sectors of the food sector clearly indicates the scope for improvements in the sector. The issue of product development / process improvement / Quality certification etc. have been discussed in detail in the earlier section. FTTTDC should focus on:

- Providing technical support services in the areas of Process Design & Improvement
- Providing technical support in the form of consultancy & advisory services to the existing units and green field projects in the food sector in different fields i.e. food processing machine selection, design of packaging, trouble shooting in processing, productivity & quality improvement etc.
- Conduct market research and Feasibility Studies for expansion / green field projects
- Consulting support for international certification including HACCP

5.4. EDP PROGRAMMES

The food sector study clearly indicates the scope for developing new projects. With a dearth of entrepreneurial capabilities in the Sultanate, FTTTDC has to focus on developing entrepreneurs. Conducting Entrepreneurship Programmes with the support from banks / funding agencies would go a long way in inducing fresh investments / projects in the sector.

5.5. INCUBATION SERVICES

FTTTDC in addition to conducting EDP programmes should also provide the necessary incubation facilities for making trial production and test marketing the products. These services could be effectively used by the existing manufacturers for launching and test marketing of new products as well as new entrepreneurs to use the service before establishing their own projects.

5.6. TESTING AND CERTIFICATION SERVICES FOR GOVERNMENT

Setting up a national test house for Food products and assist DGSM and Ministry of Regional Municipalities, Environment and Water Resources, with respect to quality standards, testing (both the local production and the imported products) and certification is the need of the hour. As discussed earlier, this would ensure consumer protection in addition to restricting import of sub-standard food products (which results in unfair competition to the local industry).

5.7. FOOD SAFETY AND CONTROL

In addition to the above, food safety and control is a critical area where in the Government would need technical support from a competent body. FTTTDC would cater to this need by providing the necessary consulting services to the Government. FTTTDC would provide the necessary consulting services to the Government in all areas related to food sector policies including the Food safety and control.

5.8. CODEX OMAN

It is recommended to set up Codex Oman as a National Codex Contact Point (NCCP) for Oman to act as a link between Codex Secretariat and Oman member body to coordinate all relevant Codex activities in Oman, besides safeguarding the interest of Oman food industry in the agenda of different Codex Committee meetings. This would be an ongoing activity of FTTTDC that would be compensated financially by the government.

5.9. FTTTDC – POSSIBLE SERVICE AREAS

The status analysis of the food sector in Oman including the problems and prospects of the sector clearly indicate the necessity to have an apex centre of excellence to deal with the issues related to the sector in the Sultanate. FTTTDC as an apex body dealing with the various requirements of the food sector in the Sultanate should have the necessary infrastructure and HR competencies to provide the following services:

Activity	Focus on
HRD – Private sector	Existing Food sector Manpower
HRD - Government	Government employees who are associated with assessing and auditing food quality and food safety related issues
Testing / Consulting / incubation Services – Private Sector	Consulting services to improve the competency /productivity / increase exports / international product acceptance etc. of the existing food sector units
Support to government in policy formulation	Formulating the Policy framework for the Government
Testing & Certification services for Govt.	Consumer protection efforts of the government / Restricting Unfair competition from imports /
Codex Oman	Representative of the Government of Oman with respect to Codex

As illustrated in the table above, FTTTDC will provide a range of services that would effectively cater to the private sector requirements, knowledge and skill up gradation for the local youth and also support the Government efforts in consumer protection as well as Food safety & standardisation efforts including Codex Oman.

6.0 MARKET ANALYSIS

6.1. FTTTDC – PROPOSED SERVICES

6.1.1. Education & Training

Based on the industry survey conducted on need assessment, the following services are required / will be required by the food sector:

- Long Term Academic Courses
  - Master in Food Science of 2 year duration
  - Graduate in Food Technology of 4 year duration (including 1 year of foundation course)
- Diploma Courses
  - Diploma in Food science of 2 year duration
- Certificate Course – 1 Year Duration
- Short Term Training Programmes for the working executives and professionals

However, from the implementation perspective, it is proposed to commence FTTTDC with the Diploma / certificate courses and gradually move towards becoming a higher education institution.

6.1.2. Testing Services – Private Sector

FTTTDC will have an exclusive Analytical laboratory, catering to the training and analytical testing requirements of food industries in Oman. The Analytical laboratory at FTTTDC will have to be recognized by DGSM & would act as an extended arm of DGSM in carrying out all analytical and quality control assignments. As per the International quality norms, the laboratory will implement a Quality Management system and get accredited as an Analytical Laboratory for carrying out Molecular, Microbiological, High Performance Liquid Chromatography, Gas Chromatography and Pesticide residue analysis on Food materials and products as per GCC, OMAN and other International standards.

It has to be noted that there are no manufacturers for certain products that are listed below, however, the discussion with the traders indicate that they would be taking up these tests in order to ascertain the consistency of the quality of the materials that they are importing.

- Cereals & Pulses
- Plantation Products
- Milk & Milk Products
- Sugar
- Microbial analysis
- Spices & Condiments
- Oils & Fats
- Artificial Sweetener
- Fruit Juice

The details of tests to be carried out for each of the above products are provided as Appendix 2 with this report.

6.1.3. Incubation & Food Processing Assignments

Considering the facilities available in FTTTDC, it is truly an incubator with potential to undertake commercial assignments. Food processing machines and analytical equipment would essentially form a part of a real Incubation centre, wherein entrepreneurs can learn the technical aspects of production machines during the technology based EDP conducted by processing department and subsequently utilize the facilities as outsourcing the products by getting them produced at FTTTDC. This arrangement will have mutual benefit for FTTTDC and entrepreneurs. As for FTTTDC, it will be an income generation activity and on the other hand, entrepreneurs can venture into product supplies without investing on plant and machinery.

It is anticipated that following technical assignments would be undertaken from industries and prospective entrepreneurs, in addition to imparting training Services.

6.1.4. Third-Party Inspections - Government

As of now the inspection and testing activities for ensuring food items is largely focused on the local manufacturing industries. The activities are carried out by MRME&WR and the DGSM under MOCI. The existing level of activities is felt as inadequate both by the industry as well as the Industry experts, as they feel that there needs to be a concerted effort to test the quality of imported food items. With imports largely outweighing the local manufacturing, the need is acute and the Governmental efforts in this regard should be more intense in this area from the angle of consumer protection, restricting unfair competition by assessing the quality of the imported food items and taking corrective action in case of poor quality and also help the trade in establishing the quality of the materials that they import.

FTTTDC would play a vital role in training the personnel of the Government as food inspectors and also become a Third party inspection agency to conduct these tests.

6.1.5. Consultancy Services – Private Sector

As the food sector grows in Oman, FTTTDC would be able to offer technical consultancy services to Industries as well as End users. It is envisaged that FTTTDC will undertake consultancy services in following areas:

- Providing technical consultancy services in the area of material selection and process optimization.
- Undertaking technical consultancy on various aspects of food industries in the field of Processing
- Undertaking technical consultancy assignments for setting up of food based projects in Oman.

6.1.6. Consultancy Support to Government

FTTTDC will play an important role as a technical support providing agency with respect to the following activities:

- Developing Standards and Specifications
- Policy formulation with respect to Food safety and Control
- Codex

6.1.7. Knowledge Repository

Considering the possibility of the development of Small and Medium Enterprises (SMEs) and the food products cluster, FTTTDC will address all the issues related to creating awareness, dissemination of information and provide documentation reference services in the field of food technology:

- Organizing awareness programmes, Seminars for processors, manufacturers and users of food products.
- Liaising with Government Departments/Ministries and Non Governmental Organizations, Industry associations for providing its expertise in food technology related issues.
- Creating an excellent Information & Documentation Centre in the form of a Library with appropriate collection of literature, Text and reference books, Journals etc.

6.1.8. Other Developmental Activities

In addition to the above commercial activities, FTTTDC will also carry out developmental activities such as:

- Providing Application & Development research related support for food based industries.
- Promoting entrepreneurship in food sector and act as a facilitator in development of a food sector.
- Developing applications ideas, concepts for import substitution of food product through In-house development.

6.2. FOOD SECTOR IN OMAN – KEY INDICATORS

The Food sector in Oman is the target market for FTTTDC. The following indicators are indicative of the market size for the proposed project:

- There 122 units medium and large scale units in the sector and an equal number of small and tiny enterprises are expected to be in operation. The units produce a wide range of food products
- There are about 16,095 personnel employed in the medium and large units in the food and beverages sector in the year 2017.
- The value of gross output in the food sector increased from RO 509.3 million in the year 2012 to RO 687 million in the year 2017 with a Compounded Annual Growth Rate (CAGR) of 6 %.
- The Gross Value addition in the food sector has increased from RO 157 million in 2012 to RO 230 Million in 2017.
- The imports of Food items into the sultanate for the year 2018 is RO 1,479 Million

The above indicators clearly illustrate that food sector is a robust and economically and socially strategic sector that plays a vital role in the overall economy.

6.3. DEMAND ESTIMATES – RATIONALE AND LIMITATIONS

FTTTDC being a pioneering effort in the GCC would have the inherent advantage of being the 'first of its kind' institute in the GCC countries. This would help it to establish itself as a self-sustaining, commercially viable project in the Sultanate.

While it is difficult to establish the precise market potential and the market share for the proposed services of FTTTDC, an effort has been made to quantify the same based on the key Indicators of the food sector in Oman and detailed discussions with the different stakeholders including the Manufacturers,

Traders, Government agencies, Retailing agencies and the experts in the sector. The following sections provide the details of the same.

6.4. ESTIMATION OF DEMAND & PROJECTED SHARE OF FTTTDC

6.4.1. Education and Training

The scope for education and training stems from the potential to train the existing employees in the sector as well as provide trained manpower (fresh) to the sector.

6.4.1.1. Existing National Workforce

The following table illustrates the existing details of employment of Omanis in the Food and beverages sector as of year 2017:

Category of Employment	Omani Employment in 2017	
	Food Sector	**Beverages**
Managers	58	35
Professionals	65	39
Technicians	104	62
Clerks	121	72
Salesmen	506	303
Craftsmen	114	69
Operators	269	161
Helpers	534	320
Total	**1,772**	**1,062**
Total No. in the technical / Support positions	**1,086**	**651**
Grand Total	**1,737**	

As it can be seen, as of year 2016, there are about 104 professionals and about 1,633 technicians, skilled workers, operators and helpers are working in the sector. With an annual growth in Omani employment in the food sector conservatively pegged at 5%, the estimated employment in the sector as of 2020 is expected to be 2,111.

6.4.1.2. Additional Future employment Omani Workforce

The following table illustrates the expected annual addition of national workforce with a conservative growth of 5%.

Year	2020	2021	2022	2023	2024	2025	2026	2027
Estimated total National workforce in technical areas in the sector	2,111	2,217	2,328	2,444	2,566	2,695	2,829	2,971
Estimated additional National workforce in technical areas in the sector		106	111	116	122	128	135	141

6.4.2. Other Services Offered to Private sector

6.4.2.1. Testing Services – Industry / Importers / Exporters

The Testing services will be requested by the existing manufacturers, the as well as by the importers of food items. The existing industry / importers would use the services of FTTTDC for assessing the quality of the material they procure as well as what they sell. The following table illustrates the number of tests that would be conducted in different sub-sectors by the private sector:

- Cereals and Pulses
- Oils & Fats
- Milk & Milk Products
- Mineral Water, Fruit Juices and Drinks
- Microbial Analysis

There are about 122 medium and large size units manufacturing finished goods worth over RO 687 million in 2017 and food items worth over RO 1479 million was imported in 201. The number of tests have been considered based on the above.

6.4.2.2. Incubation Services

The sector with many well established brands and with diversified product ranges offers potential for introduction of new products. FTTTDC is expected to get about 2 incubation assignments in the first year which would increase to about 5 assignments a year over a four year period. Achieving these targets would be enhanced by the conduct of supportive EDP programmes that would also result in new projects that would come up and may use the incubation services of FTTTDC.

6.4.2.3. Industrial Consulting Assignments

As discussed in the food sector scenario in Oman there is ample scope for FTTTDC to offer technical support in the following areas for both expansion of existing projects as well as for green field:

- Product Development
- Process Improvement / Optimisation
- Technology Selection
- Feasibility Studies
- HACCP and similar certification efforts

The number of assignments which would be in the region of 20 in the first year would double in 5 years time.

6.4.3. Services to Government Sector

6.4.3.1. Testing Services for Government

As far as Government testing activities are concerned, the current food inspection activities are limited to the sample tests done at the Directorate General of Standards and Measurement (DGSM) or by the Municipal agencies both at the Industries and the retail outlets.

The current frequency of tests are grossly inadequate and there has to be a continuous mechanism of testing the manufactured as well as imported products both from the angle of protecting the consumer interests as well as protecting the local industry from unfair competition for inferior quality

products. With this as focus there is expected to be a large number of testing requirements from the Government agencies like the Ministry of Regional Municipalities and Water resources as well as the DGSM.

FTTTDC expects to support the government in conducting tests over 10 samples taken a day (for 240 days) in the first year to about 30 samples taken per day over a five year period.

In addition, there needs to be a separate testing support required for the genetically modified (GM) food products.

6.4.3.2. Government Sector - Consultancy Assignments

The proposed FTTTDC will have a major role of providing the government in the following areas:

- Formulating Food sector Regulations / Policies
- Developing Standards and specification & Certification of food products
- Food safety Legislations
- Establishing Codex and Oman within FTTTDC and interaction with the Codex secretariat

6.5. COMPETITION

The existing training institutes and vocational centres offer basic engineering related training and skill development programmes including the following trades like Fitter, Electrician, Fire & Safety etc. There are no training institutes available in Oman or even in the GCC countries for imparting specific skills needed for working in the food sector.

However, for the sake of estimating some of the critical project assumptions in terms of the fees etc., the existing fee structure of the Higher Education institutions in Oman have been taken into consideration.

6.6. PROPOSED MARKETING MIX STRATEGY FOR FTTTDC

6.6.1. Service Mix Strategy

6.6.1.1. Range of services

FTTTDC is conceived as a centre of excellence providing comprehensive aet of services covering most of the requirements of the private sector and government sector stakeholders of the food sector. The following services are planned as part of FTTTDC operation:

- Education and Training
- Testing Services – Industries / Traders
- Incubation Services
- Industrial Consulting Assignments
- Testing Services for Government
- Government Sector - Consultancy Assignments

6.6.1.2. FTTTDC – Key Training Principles

The guiding principles for adopting the methodology of operating FTTTDC are:

- Practical orientation with thrust on hands on experience of Individual trainees on pilot type machines so that they are transformed into Skilled Process technicians in the respected areas and can be directly employed in the production operations.
- FTTTDC will undertake commercial assignments /job works / incubation services from industry, which will enable in imparting Practical Training /exposure to trainees on real production jobs.
- Class room teaching with extensive use of audio-visual aids, tutorials and assignments to impart effective theoretical knowledge.
- Development of Communication skills in English through class room teaching

- Providing inputs on soft skill development (Behavioral Science) to mould them into effective employees with the right attitude towards work and work place.
- Promote Theme of "learning while working on Machines "
- To inculcate habit of reading text and reference books of related subjects in library through allocating hours for library for each long term courses.

6.6.2. Service Pricing

The centre will offer a set of training courses as well as provide a host of other technical / consulting / Job work and developmental services as indicated in the earlier sections of the report.

Though similar courses / testing facilities are not available in Oman for assessing the competitive scenario, the study has considered the charges for other types of chemical analysis in the Sultanate and the charges available elsewhere (currently by CFTRI, India) before arriving at the course fees and the testing charges.

The following table illustrates the service pricing that is proposed (considered for the financial analysis) for the FTTTDC. Though the service rates will widely differ based on the nature of service, the following is an indicative average pricing considered per assignment. As it can be seen, the charges have been arrived are reasonable and affordable by the industry.

Courses/ Services	**Course Duration**	**Fees per trainee per year / fee per assignment (RO)**
Diploma in food science	2 years	3,900
Certificate Course in Food science & Tech	1 Year	3,900
Skill Up-Gradation courses	3 months	1,125
Short Term Training Programme	2 – 4 weeks	750
Entrepreneurship Training	3 months	1,500
Chemical Analysis – Mineral Water, Juices and Drinks	-	75

Courses/ Services	Course Duration	Fees per trainee per year / fee per assignment (RO)
Chemical Analysis – Cereals, Pulses, Spices, Milk & Milk products	-	100
Chemical Analysis – Oils And Fats	-	150
Microbial Analysis	-	150
Third party (Government) inspection / Testing charges	-	100
Food Processing - consulting Assignments for Private Sector	-	6,000
Consultancy & Advisory Services to government	-	10,000

6.6.3. Promotion / Affiliation

The primary promotion tool will be the association with a food technology centre with sufficient exposure and expertise in the similar areas of providing training and technical services to the food sector, in establishing and running the FTTTDC.

The following section provides a brief profile of Central Food Technology Research Institute (CFTRI), the apex body concerned with similar activities in India, which could be taken as a model agency for affiliation.

6.6.3.1. Profile of Central Food Technology Research Institute (CFTRI)

Central Food Technology Research Institute (CFTRI) is a research institution under the Council of Scientific & Industrial Research (CSIR) - the premier industrial R&D organization in India under the Ministry of Science and Technology. CSIR has a network of 38 national research institutes and laboratories devoted to specific areas (List given as Appendix 3). CFTRI was the third national research institute devoted to food sector and was opened in October 1950. The CFTRI is located in the heart of the city in a land of area 1 million sq. metres.

Its multi-disciplinary spread (across 17 R&D departments) covers almost every field of scientific investigation connected with food sector including food biotechnology. CFTRI employs over 250 scientists, technologists and engineers, and over 400 technicians, skilled workers and support staff. The 17 R & D departments and 6 support departments are as follows:

R & D Departments

- Biochemistry and Nutrition
- Fermentation Technologies and Bioengineering
- Flour Milling, Baking & Confectionery Technologies
- Food Engineering
- Food Microbiology
- Food Packaging Technology
- Food Protectants and Infestation Control
- Food Safety & Analytical Quality Control Laboratories
- Fruit & Vegetable Technology
- Grain Science and Technology
- Human Resource Development
- Lipid Science and Traditional Foods
- Meat, Fish and Poultry Technology
- Plant Cell Biotechnology
- Plantation Products, Spices and Flavour Technology
- Protein Chemistry and Technology
- Sensory Science

Support Departments

- Central Instruments Facility and Services
- Engineering & Mechanical Maintenance
- FOSTIS-Library
- Department of Information and Publicity

- Planning, Monitoring and Co-Ordination
- Technology Transfer and Business Development

In order to ensure that the endeavours in technology ultimately reach the customer, CFTRI has established the Technology Transfer and Business Development Department (TTBD) as its single technology-window to the outside world. The department is engaged in transferring the benefits of CFTRI's knowledge and experience; technologies and talents; and equipment and environment, to the Indian food industry and society at large.

6.6.3.2. CFTRI Expertise & Relevance to Oman

CFTRI has the necessary resources in terms of facilities and expertise to set up the FTTTDC that is envisaged in Oman. Since they are doing similar operations, it will be easy and effective for them to do this in Oman.

Of particular importance are the following facilities / expertise in the following sub-sectors which are predominant in the Sultanate:

- Flour Milling, Baking & Confectionery Technologies
- Fermentation Technologies and Bioengineering
- Meat, Fish and Poultry Technology
- Fruit & Vegetable Technology
- Food Safety & Analytical Quality Control Laboratories
- Food Packaging Technology
- Technology Transfer and Business Development.

The top management of the Institute has a good understanding of Oman and its needs. The director was personally involved in a food related study in connection with Vision 2020. Their association in the current sector study has further enhanced their understanding of the Sultanate.

CFTRI is keen on a strategic association with Ministry of Commerce Industry in Oman to set up FTTTDC.

6.7. MARKET SHARE PROJECTIONS

6.7.1. Estimated number of Trainees and the Training Revenue

The following table illustrates the estimated number of trainees and the revenue projections:

Year of Operation		2023	2024	2025	2026	2027
Estimated total National workforce in technical areas in the sector		**2,444**	**2,566**	**2,695**	**2,829**	**2,971**
Estimated additional National workforce in technical areas in the sector		**116**	**122**	**128**	**135**	**141**
1		**Semiskilled Operator course for fresh employment - 1 Year course**				
	% of additional employment	20%	25%	30%	25%	25%
	No. of students/ year	23	31	38	34	35
	Fees- per year per student (RO)	3,900	3,900	3,900	3,900	3,900
	Income (RO)	**90,782**	**119,152**	**150,131**	**131,365**	**137,933**
2		**Skilled Operator Course for fresh employment- 2 year course**				
	% of additional employment	20%	25%	30%	25%	25%
	No. of students/year	23	31	38	34	35
	Fees per course per trainee	3,900	3,900	3,900	3,900	3,900
	Income (RO)	90,782	119,152	150,131	131,365	137,933
3		**Craftsman Course (Skill Up-gradation) - 3 months**				
	% of Total employment	6%	7%	8%	8%	8%
	No. of students/ year	147	180	216	226	238
	Fees- per year per student (RO)	1,125	1,125	1,125	1,125	1,125
	Income (RO)	164,979	202,099	242,519	254,645	267,377
4		**Short Term Training Programme (2-4 weeks)**				
	% of Total employment	6%	7%	8%	8%	8%
	No. of trainees / year	147	180	216	226	238
	Fees per course per trainee	750	750	750	750	750

Year of Operation		2023	2024	2025	2026	2027
		109,986	134,733	161,679	169,763	178,252
5		**Entrepreneurial Development Programme (3 months)**				
	No. of trainees / year			5	5	5
	Fees per course per trainee			1,500	1,500	1,500
				7,500	7,500	7,500
Total no. of trainees in an year		340	420	508	520	546
Total Income		**456,529**	**575,135**	**711,960**	**694,638**	**728,994**

6.7.2. Illustration of Share of Revenue from Private sector

For the purpose of projection, a growth rate of 5% (as a against a CAGR of 6% over the past 6 years) has been considered for the value of finished goods manufactured and a 3% growth rate (in line with the population growth rate) has been considered for the imports. The following table provides the projected revenue earnings of FTTTDC (expenditure for the Private sector) along with the Total value of manufactured goods and the imports to illustrate the share of private sector expenditure in the testing and other services of FTTTDC:

Details	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Value of Finished goods (RO Million)	1,031	1,083	1,137	1,194	1,254	1,316	1,382	1,451	1,524	1,600
Imports (RO Million)	1,715	1,766	1,819	1,874	1,930	1,988	2,048	2,109	2,173	2,238
Total value (RO Million)	2,746	2,849	2,957	3,068	3,184	3,304	3,430	3,560	3,696	3,838
FTTTDC Revenue (RO Million)	0.534	0.751	0.979	1.109	1.109	1.109	1.109	1.109	1.109	1.109
FTTTDC revenue as a % of the total value	0.02%	0.03%	0.03%	0.04%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%

As illustrated above the projected revenue for FTTTDC, that would be coming from the private sector for various testing, consulting and incubation services required by them works out to a very small % of the total value of goods.

Hence, it is felt that the projections are conservative and the requirement for these services would also go-up once the local manufacturers start exporting products to advanced markets like USA (since the FTA opens up new avenues for Omani manufacturers) where the approvals and quality standards are more stringent. FTTTDC can play a vital role as an internationally accredited laboratory in various product approvals.

6.7.3. Projected Revenue from the Services to Government sector

The above referred activities would be provided to the government at a prescribed fee and the revenue expected from such assignments in the first five years of operation are as follows:

Detail	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue from Government sponsored Consulting assignments (RO ' 000)	50,000	70,000	100,000	150,000	200,000

7.0 TECHNICAL ANALYSIS

7.1. LAND AND LOCATION

The Training Centre is proposed to be located in Muscat. An area of 20,000 Square Meters of land is required for the project. It is proposed that the required extent of land with all infrastructural facilities such as electricity, water and road could be obtained on lease.

7.2. BUILDING

It is estimated that 10,070 square meters of built up area is required for class rooms, seminar halls, laboratories, library, office, prayer hall and for other miscellaneous purposes. This built up area is estimated based on the proposed activities of FTTTDC such as training and services in processing, testing, information and documentation, support services, and other miscellaneous services. The standards stipulated by the Ministry of Higher Education of Oman are also taken into consideration while designing the area requirement of buildings. The institute building is to be so designed that it will not only be sufficient to carry out training and development activities of the immediate future but also to meet the long-term needs of the sector. The building requirement for each section is provided in the following sections:

7.2.1. Class Rooms

As training is one of the main activities of FTTTDC, the class room facilities are very essential for the institute. Hence it is proposed to allot 600 sq. m. of built up area for lecture halls to conduct theory classes for the trainees. (300 students x 2 M^2 per student).

7.2.2. Seminar Hall / Auditorium:

In addition to regular long term and short term training programme, the institute will organize programmes like food processing industrial meet, seminars, etc. In such functions, more than hundred participants of different background from industries are expected to come to discuss about their

problems and latest technological development in food industries. To organize such meetings & seminars an Auditorium is very essential. Hence, a Seminar Hall/Amphitheatre with a space of 2,000 sq. meters of built-up area is included in the institute complex. This satisfies the stipulation of providing 10 Sq. M of area per student for 200 students. Apart from the technical meetings, the auditorium will be used to conduct functions such as annual day of students and other social functions related with the institute, where staff and trainees will also participate.

7.2.3. Testing Laboratory

Training in quality control and rendering testing services to food industry is another important activity of FTTTDC. There are separate laboratories such as food chemistry lab, microbiology lab, instrumentation and food science lab each catering to different aspects of the analysis of food. The chemistry lab is equipped for chemical analysis and the microbiology lab is equipped for microbial analysis such as detection of pathogens. Each of the labs is to be equipped with advanced equipment/instruments required to carry out training, testing and other developmental work for the industry. Apart from this; a separate testing laboratory is set up with an area of 1,200 sq. m for testing food products.

7.2.4. Pilot Plant

The Pilot Plant and Food Engineering Department is planned in 1,200 sq.m of built-up area. The Pilot Plant will be useful for students in the main stream and for those participating in the short term and entrepreneurial programmes. The plant will have a testing room to test the samples produced in this section and training for the students.

The Pilot Plant is equipped with machines like fruit mill, fruit pulper, mini bakery unit, hammer mill, grain mill and packaging machinery. The participants are trained in the operation of these machines so as to gain rudimentary knowledge on the manufacturing process.

7.2.5. Food Processing Section

One of the main activities of FTTTDC is to train and develop highly skilled technical personnel for the processing industry and to undertake industrial assignments. The food processing lab is designed to have 1200 Sq. m of built up area in order to accommodate all types of bakery machines and other types of food processing machinery. The processing lab is planned to erect/install the machinery as per the specification required to carry out the training programme of not less than 20 trainees at a time and development work simultaneously.

7.2.6. Information and Documentation Centre (Library)

It is proposed to create a well-equipped library in the built up area of 200 Square Meters. It will have the collection of latest journals, books, magazine and other data about testing, processing and latest developments in the field of food science for the industry. The facilities available in the library will be useful for the trainees of the institute as well as for the industry.

7.2.7. Other Laboratories

In addition to the main laboratory, there will be 4 additional labs. The total built-up area of these labs is about 2,400 sq. meters (600 sq. meters X 4 labs)

7.2.8. Computer Lab

The area considered for the Computer lab is about 500 sq. meters.

7.2.9. Administrative Offices

The area for registration and admission office and the office for admin and academic staff is about 1,000 sq. meters.

7.2.10. Meeting Halls

In addition to the main seminar hall, there will be small meeting rooms of 50 to 100 sq. meters each. The total area considered is about 250 sq. meters

7.2.11. Small Meeting rooms for Departments

Each of the main departments shall have exclusive small meeting rooms. The total area considered is about 200 sq. meters (8 meeting rooms X 25 sq. meters each).

7.2.12. Other Building areas

The following table illustrates the other building areas considered for the project:

Facility	Area in sq. meters
Reading Rooms	110
Canteen & Kitchen	150
General Store	30
Chemical Store	30
Prayer Halls	120
Security Building	30
Gymnasium	200
Clinic	50
Total	**720**

7.3. PLANT, MACHINERY & EQUIPMENT REQUIREMENTS

Training programmes of FTTTDC would be highly practical oriented; hence all the basic and modern equipments are required to match international standards. The basic training imparted at the initial stages will empower the trainees to have hands on experience in the food processing machines and laboratory equipments. Since the food processing lab at FTTTDC centre is planned to have all the basic and advanced machinery/equipments it will be possible to carry out all training and developmental activities. Equipment/ machinery proposed for FTTTDC centre in Oman is listed in Annexure – 1.3. An overview of facilities and activities of different department of FTTTDC is described below.

7.3.1. Food Engineering Lab & Pilot Plant Department

The envisaged expansion and growth potential of the industries in processing sector have also brought modern technologies imported from developed countries in Oman. It would be a major consideration for FTTTDC to keep pace with the new technological development in food processing and in order to do so infrastructure in the form of modern machines and equipments will be created. The quality of the food product largely depends on the processing machinery and Hands-on skill of Manpower; hence emphasis would be given to impart adequate practical skill on processing machinery to cater to the needs of food processing industries in Oman.

The Pilot plant department of FTTTDC will have an extensive range of practical training facilities comprising of Basic Conventional machines (Annexure-1.3). The facilities will be utilized for conducting practical training of students of long term courses as per the curriculum and practical schedule.

7.3.2. Food Microbiology Department

FTTTDC will have a sophisticated microbiology laboratory for characterizing and evaluating different properties of food material and products. The activities of the Microbiology Department are listed as follows:

- To conduct long term and short term training programmes on quality control and testing of food materials and products.
- To educate the industries on selection and identification of materials.
- To serve the industries through testing of their materials and products.
- To carry out developmental work.
- To work in application development in thrust area.
- To design and develop test methods for new products and to develop suitable equipments.

The department will be well equipped with Latest equipment for analysis of toxic metal contaminants and minerals by atomic absorption spectroscopy. The facilities will be utilized for imparting practical training & Hands-on exposure to Trainees of long term courses. Special emphasis will be given to familiarise the students on important physico-chemical parameters such as turbidity, TDS, pH, chloride, sulphate and pesticide residues. Detection of hygiene indicator groups of microorganism like aerobic mesophillic bacteria, coli form and familiarisation with specific pathogens namely salmonella, shigella, pseudomonas will be an added advantage. Also, the Testing centre will obtain recognition from DGSM to carry out food material and product testing as per different Standards prevailing in Oman. As per the International quality norms, the laboratory will implement a Quality Management system and get accredited as a Testing Laboratory.

7.3.3. Food Chemistry Department

The following activities are planned to be carried out in Food Chemistry Department for the technical support to industries.

- To develop skilled manpower in the field of chemical analysis of food materials.
- To conduct Short-term tailor made courses for industries.
- To develop new products for the food industries.
- To impart knowledge to food manufacturers regarding carbohydrates, proteins, lipids & enzymes
- To familiarize them on non-enzimic and enzimic reactions of food during storage and uses of enzymes in the food industry.

All the above mentioned activities require full-fledged laboratories having all facilities in terms of equipments/machinery and trained manpower.

7.3.4. Food Processing Department

The Processing department proposed will be equipped with basic equipments for preliminary training and modern equipments for advanced training as well as development of products. The activities in the department will mainly cover:

- Long and short term training programme of basic and advanced nature on food manufacturing.
- Use of facilities for application development through product design.

A list of machines/equipments for the department is given in Annexure-1.3**.**

7.3.5. Instrumentation Department

The department will be equipped with state of the art instruments like HPLC, LCMS, CG, GCMS and Spectrometer. This department will meet the training needs of the industry in equipping their employees in the operation and maintenance of the modern equipments. The list of equipments required for the Instrumentation Department is given as Annexure-1.3.

7.4. FACULTY QUALIFICATIONS

The Faculty will be responsible for taking theory classes as per schedule and curriculum of respective courses and supervise other technical activities described above. They will be selected based on technical qualification and experience in the relevant field. Each department will have HODs with Doctorates in the relevant field with a minimum of 5 years teaching experience in an institute of repute. The Middle Level Faculties will have Masters Degree in subjects such as Food Science and Technology, Chemistry, Biochemistry, Nutrition, Microbiology, Food Engineering, Agriculture, Physics and Mathematics with a minimum of 5 years teaching experience. The junior level faculties will be holders of first class Masters Degree in subjects as described above for middle level with a minimum of 3 years teaching/industrial experience.

Besides the above technical requirement, Communication skills in English and Arabic, zeal for teaching and undertaking other technical assignments will also be evaluated during the selection process.

Further, it is imperative to have Omani Faculty ,having fluency in Arabic as well as English at FTTTDC, hence, it is emphasized that initially 2 to 3 Omani Officials with minimum of Higher National Diploma or Engineering qualification and experience in the Food Sector will be drawn from existing Government Institutions or Ministry and sent to Food Technology Institution of International repute for undertaking short duration courses in Food Technology and to get an exposure to the Training methodology & Infrastructure requirement so as to transform them into Trainer/Faculty for conducting training courses at FTTTDC.

7.5. QUALIFICATIONS FOR PRACTICAL INSTRUCTORS

Practical Instructors will be assigned responsibilities to carry out practical demonstrations on machines and laboratory equipments in the respective departments for the different long term and short term courses. Since the infrastructure in terms of machinery and equipment in all the departments like food processing, food chemistry, microbiology, instrumentation departments is in the form of Incubators, which can be used for training demonstration as well as Job works for testing of food material etc. Apart from testing of food materials in testing laboratory, the Practical Instructors will also work as Production Technicians in laboratory to accomplish the technical assignment in their area, which would fetch internal revenue to the respective department and in turn to the kitty of FTTTDC. The Technicians will be first class degree/diploma holders with 3 years' experience in the operation and maintenance of machinery/lab equipments related to food industry.

7.6. TRAINING CAPACITY

The total capacity of FTTTDC to train Manpower in long term courses would be 300 per annum, which includes batches of semi-skilled course of 1 year duration, skilled operator course of 2 year duration and craftsman course of one year duration. Similarly 29 short term courses with intake of 10 in each course can be conducted every year i.e. 290 (29x10) participants per annum. Technology based Entrepreneurship Development programmes (TEDPs) also will be conducted each year for 50 (2x25) participants.

The Short term course topics and course contents will be designed as per the requirements, specific needs of the Industry or on current technology trends having relevance to Omani scenario and would be planned on annual basis. Similarly Technology based Entrepreneurship Development programmes (TEDPs) for food sector would be scheduled every year with target of training 5 participants in a year.

7.7. CAPACITY FOR OTHER SERVICES

Capacity for other services is difficult to be assessed and will be totally market driven. However the performance that has been considered for the financial projections are well within the capabilities of the proposed Centre both in terms of facilities as well as manpower.

7.8. SELECTION OF TRAINEES AND TRAINING METHODOLOGY

7.8.1. Long-term Courses

An outline of all long term courses have been worked out and described under the head PROPOSED SERVICES. The entry qualification has been prescribed for each course. The following are the proposed process for the selection of trainees and providing training services:

- Once the necessary approval from Ministry of Manpower is obtained, the admission process to select Students for these courses will commence and applications will be invited from the Students of desired qualifications through Advertisement in Newspapers.

- The applications received for various courses will be screened to verify the prescribed entry qualification of respective courses.
- Once the screening is completed, eligible candidates will be called for Interview before a Selection committee as constituted by the Ministry.
- Based on the Interview performance and recommendations of Selection committee, selected candidates will be sent for joining the course.
- The two semester academic year of FTTTDC will commence from September every year and at the end of each semester, the Examination of theory subjects as well as Practical will be conducted to evaluate the performance of each Trainee.
- The successful candidates who get through the Final Examination will be awarded Course completion, Diploma, craftsman Diploma under a franchise arrangement with Food Technology Institution of International repute.

7.8.2. Short-Term Skill Up gradation Courses

As regards Short duration skill cum technology courses for the existing manpower of the Industry, based on the requirements of the industries, course-contents will be worked out, which will be vetted by the Industries before commencing the programme. As per the course contents of short duration programmes, theory and practical in the respective departments will be organized and a course material (Hard or Soft Copy) will be given to each participant. The feedback of all these programmes would be collected from Industries as well as participants, which will be analyzed for scope of improvement in future programmes.

7.9. DELIVERY MECHANISM FOR TECHNICAL SERVICES

As indicated in different sections of the report, the FTTTDC will undertake a host of assignments in Technical areas including food processing work, Consultancy assignments, testing assignments etc. These activities will be assigned to the concerned Head of the department/Faculty, whose responsibility will be to effectively plan and schedule the training as well as Technical activities in the respective department. In a nutshell, the working methodology of FTTTDC would be a unique blend of an Institute & Industry, wherein the Social & developmental objectives of HRD as well as nurturing of business opportunities for sustainability of FTTTDC could be done under one Institutional Framework.

This blend of Institute & Industry would certainly produce the technically skilled and trained manpower of desired level so as to take their role as Process Technician/Lab supervisor/food technology Specialist from the Day 1 in the Industry and also valuable services to the industries, which would yield substantial revenue generation for FTTTDC and support in becoming a self-sustaining organization. The targeted services and major capabilities of FTTTDC are briefly explained as below:

7.10. NUMBER OF TRAINEES, FEES AND COST OF CONSUMABLES

Details	Year 1	Year 2	Year 3	Year 4	Fee in RO / Student / Year or per course	Expected Cost of consumables (RO / Student)
Semi-skilled operator Course – 1 year	23	31	38	34	3,900	50
Skilled Operator Course – 2 years	23	31	38	34	3,900	100
Craftsman Course – Skill Up gradation – 3 months	147	180	216	226	1,125	120
Short Term Training (2 to 4 weeks)	150	200	290	290	750	30
EDP Programmes – 3 months			5	5	1,500	80
Total number of trainees	340	420	508	520		

7.11. EXPECTED NUMBER OF CONSULTING SERVICES, ANALYSIS AND TESTS

Details	Year 1	Year 2	Year 3	Year 4	Year 5
Incubation services	2	3	4	5	5
Third Party inspection (Government)	2,400	3,600	4,800	6,000	6000
Chemical analysis of cereals, pulses etc.	180	240	300	300	300
Chemical analysis of oils & fats	240	360	480	480	480
Chemical analysis of milks & milk products	240	360	480	480	480
Chemical analysis of mineral water, fruit juices & drinks	480	600	720	720	720
Microbial analysis	600	800	1000	1000	1000
Food Processing assignments	20	25	30	30	30
Consultancy & Advisory Services including Codex- Government	5	7	10	15	20

7.12. CONSUMABLES FOR OTHER SERVICES

Expenditure on various consumable related to providing other services such as testing, consultancy and job works, are estimated to be as shown below.

Services	Unit	RO
Incubation services	Average cost of consumables per job order	500
Third Party inspection	Average cost of consumables per Inspection	10
Chemical analysis of cereals, pulses etc	Average cost of consumables per job order	10
Chemical analysis of oils & fats		15
Chemical analysis of milks & milk products		10
Chemical analysis of Mineral water, fruit juices & drinks		8
Microbial analysis		15
Food Processing assignments - Private Sector	Average cost of consumables assignment	300
Consultancy & Advisory Services from the Government		25

7.13. FRANCHISE FEE

The FTTTDC is expected to obtain continued support from institutions like CFTRI, India by providing advisory services on in its management and on timely up gradation of facilities. A provision of 5% of training income is made to provide for payment of franchise fee.

7.14. UTILITIES

7.14.1. Water

Consumption of water is for processing of food items, circulating water to machines and for general consumption of trainees, faculty, staff and visitors. Requirement for processing & machines is estimated to be at about 13,660 KL per year. Water supply is expected to be availed from public water supply network. The cost of water is RO 0.770 per cubic metre.

7.14.2. Electricity

Since FTTTDC is a training institute, it requires uninterrupted power supply. Installed electrical load is 60 KW to run the machines and to meet the day today activities of the institute. Required supply of electricity per year is as under.

- Electricity- For Machines : 72,000 KWH
- Electricity- Office & workshops, lab, etc. : 2,083,200 KWH
- Electricity- canteen etc. : 37,800 KWH

The cost of electricity is considered as RO 0.030 per KWH.

7.15. OVERHEAD EXPENSES

This includes repair and maintenance of machinery and insurance premium for assets.

7.16. RENT FOR LAND

The rent payable for the leased land is considered at RO 1 per square metre for 20,000 square metres.

7.17. IMPLEMENTATION PERIOD

The project is expected to be completed in 18 months from the date of allocation of funds.

8.0 FINANCIAL ANALYSIS

8.1. COST OF PROJECT

The total cost of the project is estimated at RO 3.910 million including the working capital required for the project. The break-up is given below:

Details	Amount (RO)
Land	On Lease
Land Development	79,000
Building	1,656,000
Machinery and Equipment	990,000
Vehicles	72,000
Furniture & Office Equip.	182,000
Pre- Operative Expenses	457,000
Contingency	221,000
Sub Total	***3,657,000***
Working Capital	**253,000**
Total Project Cost	**3,910,000**

8.1.1. Land

The centre requires land having area of 20,000 Square Meters. The rental rate is considered as RO 1 per Square Meter per year with an escalation of 15% every 5 years.

8.1.2. Land Development

The cost of levelling, compound wall and fencing, internal roads, landscaping, playground, etc. is estimated at RO 79,000. Details are in Annexure 1.1.

8.1.3. Building and Civil Structures

The centre will have its own building constructed at an estimated cost of RO 1.656 Million. Details are in Annexure 1.2.

8.1.4. Machinery and Equipment

The Machinery and equipment include the pilot plant facilities, food processing facilities, food testing lab facilities etc. The erected cost of the above equipment and other auxiliary equipment is estimated at RO 990,000 (See Annexure- 1.3).

8.1.5. Vehicles

The center will have 3 saloon cars and 3 pickups for general office use. The total cost of vehicles as per Annexure 1.4 is RO 72,000.

8.1.6. Furniture and Office Equipment

Office Equipment for Training Centre and Administrative Office, reference books for Information Centre, etc. are estimated to cost RO 182,000. Details are provided in Annexure 1.5.

8.1.7. Preliminary & Pre-operative expenses

The provision for preliminary and pre-operative expenses made is RO 457,000 as detailed in Annexure 1.6. This includes expenses on preliminary expenses, feasibility studies, initial fee payable to the Technical partner for establishing and project management, visa and passage expenses for expatriate staff joining, salary for staff prior to operation, etc.

8.1.8. Contingencies

Contingencies are provided at 10 % of machinery and equipment, and 5% of the costs of building, vehicles, furniture and office equipment. The total provision for contingencies works out to RO 221,000 as shown in Annexure 1.7.

8.1.9. Working Capital

The assumption is made as follows.

Particulars	Period
Receivable	2 Months
Consumables & Franchise cost	2 Months
Utilities	1 Month
Salaries	1 Month
Admin Expenses	1 Month
Marketing Expenses	1 Month
Finance Cost	1 Month

The working capital calculation is based on the industry norms. The working capital requirement of the center is expected to be RO 253,000 in the first year of operation and increase to RO 290,000 for the second year of operation. Details are provided in Annexure 1.8

8.2. MEANS OF FINANCE

The following table provides the means of finance of the project:

Means of Funding	Amount (RO)
Equity Capital	1,564,000
Term Loan from commercial Bank @ 6%	2,194,000
Sub-Total	***3,758,000***
Working Capital Loan @ 6%	152,000
Total	**3,922,000**

8.3. COST OF SALES

Annexure 2 gives the detailed calculation of cost of sales. It is summarized as below for the first 5 years of operation.

	Year of Operation	1	2	3	4	5
	Long Term Trainees per year	47	61	77	67	71
	Short Term Trainees per year	293	359	431	453	475
No	**Detail**	**In RO '000**				
1	Cost of consumables	96	128	161	176	180
2	Franchise cost (@ 5% of the revenue)	23	29	36	35	36
3	Utilities	39	52	65	57	60
4	Salaries (Faculty)	365	427	490	499	512
5	**PRIME COST**	**523**	**636**	**752**	**767**	**788**
6	Overheads	58	77	95	100	105
7	Rent- land	20	20	20	20	20
8	**Factory Cost**	**601**	**732**	**867**	**887**	**913**
9	Admin. Salaries	166	170	222	229	234
10	Admin. Expenses	41	41	41	41	41
11	Total Admin expenses	206	211	263	269	275
12	Marketing Salaries	19	19	23	20	21
13	Advert.& Business Promotion	6	6	6	6	6
14	Total sales & distribution costs	25	25	29	26	27
15	**OPERATING COST**	**832**	**969**	**1,158**	**1,182**	**1,215**
16	Interest on term loan	132	132	128	111	95
17	Interest on working capital	9	9	9	9	9
18	Total finance cost	141	141	137	120	104
19	Depreciation	155	155	155	155	155
20	Prelim Expenses written off	457	0	0	0	0
21	**COST OF OPERATION**	**1,585**	**1,264**	**1,450**	**1,458**	**1,474**

8.4. REVENUE

Annexure 3.1 gives the detailed calculation of income expected. It is summarized as below for the first 5 years of operation.

(Figures in RO '000)

Details	Year 1	Year 2	Year 3	Year 4	Year 5
Semiskilled Operator course for fresh employment - 1 Year	91	119	150	131	138
Skilled Operator Course for fresh employment- 2 Years	91	119	150	131	138
Craftsman Course (Skill Upgradation) - 3 months	165	202	243	255	267
Short Term Training Programme (2-4 weeks)	110	135	162	170	178
Entrepreneurial Development Programme (3 months)	0	0	8	8	8
Incubation services	20	30	40	50	50
Third Party inspection Services for the Government	240	360	480	600	600
Chemical analysis of cereals, pulses etc.	18	18	30	30	30
Chemical analysis of oils & fats	36	54	72	72	72
Chemical analysis of milks & milk products	24	36	48	48	48
Chemical analysis of Mineral water, fruit juices & drinks	36	45	54	54	54
Microbial analysis	90	120	150	150	150
Food Processing assignments - Private Sector	70	88	105	105	105
Codex & Other Intl. Assignments	50	70	100	150	200
Total	**1,041**	**1,396**	**1,791**	**1,954**	**2,038**

8.5. NET PROFIT AND PROFITABILITY ANALYSIS

As per the financial projection in Annexure – 3 the centre is profitable. The summary of the analysis is given under.

	Year of Operation	1	2	3	4	5
No	**Item**	**Figures in RO ' 000**				
1	**Operating Cost**	832	969	1,158	1,182	1,215
2	Expected Revenue *					
a	Training	457	575	712	695	729
b	Other Services	584	821	1,079	1,259	1,309
c	Total	1,041	1,396	1,791	1,954	2,038
3	**EBIDTA**	**208**	**427**	**633**	**771**	**823**
4	Depreciation	155	155	155	155	155
5	Finance Cost	141	141	137	120	104
6	**Operating profit**	**-88**	**131**	**341**	**496**	**564**
7	Other income if any					
8	Prelim Expenses written off	457	0	0	0	0
9	Profit/Loss before tax	-545	131	341	496	564
10	Income Tax	0	0	0	0	0
11	**Profit after tax**	**-545**	**131**	**341**	**496**	**564**
12	Statutory reserve	0	13	34	50	56
13	Profit for appropriation	-545	118	307	447	508
14	Dividend	0	0	0	0	0
15	General reserve	-545	118	307	447	508
16	**Net cash accruals**	**67**	**286**	**496**	**651**	**720**

The centre will have a cash profit during the first year of operation. The centre will make net profits from the second year of operation.

8.6. RATIO ANALYSIS

The detailed ratio analysis is provided as Annexure 11 and a summary is illustrated in the table below:

Ratio	Year 1	Year 2	Year 3	Year 4	Year 5
Cost Ratios					
Consumable / Total Income	9%	9%	9%	9%	9%
Franchise Cost/ Income	2%	2%	2%	2%	2%
Utilities / Total Income	4%	4%	4%	3%	3%
Salary of Faculty / Total Income	35%	31%	27%	26%	25%
Prime Cost / Total Income	50%	46%	42%	39%	39%
Overheads / Total Income	8%	7%	6%	6%	6%
Cost / Total Income	58%	52%	48%	45%	45%
Administrative exp. / Total Income	20%	15%	15%	14%	13%
Marketing exp. / Total Income	2%	2%	2%	1%	1%
Finance Cost / Total Income	14%	10%	8%	6%	5%
Non-Cash exp. /Total Income	59%	11%	9%	8%	8%
Total Cost / Income	152%	91%	81%	75%	72%
Profitability Ratios					
PBDIT / Revenue	20%	31%	35%	39%	40%
Operating profit / Revenue	-8%	9%	19%	25%	28%
PAT / Revenue	-52%	9%	19%	25%	28%
PAT / Investment	-14%	3%	9%	13%	15%

8.7. KEY APPRAISAL CRITERIA

Detail	Value
IRR on total investment	12.2%
IRR on Equity	15.7%
Payback period of Total Investment	6 Years 10 Months
Payback period of Equity Investment	7 Years 1 Month
Break Even point (as % of Revenue)	65%
Cash Break Even Capacity (as % of Revenue)	56%
Total debt equity ratio	1.5 : 1
Debt Service Coverage Ratio	2.11

8.8. SENSITIVITY ANALYSIS

Sensitivity analysis has been carried out to determine the susceptibility of the project to changes in main variables and the results are as given below. A variation of 10 % is taken for ascertaining the sensitivity of the project to the different parameters:

Particulars	Original	Number of Trainees (-10%)	Reduction in income (10%)	Operating Costs (+10%)	Fee (-10%)
IRR on total investment (%)	13.0	11.4	8.4	10.1	11.3
IRR on equity investment (%)	15.7	12.9	7.5	10.5	12.6

9.0 RISK FACTORS

As the sensitivity analysis indicates, the project is sensitive to fall in revenue earnings, which are dependent up on the fee and the number of trainees as well as the consulting assignments.

The courses being offered are relatively new to the Sultanate and the acceptance of the same and the willingness of the trainees to enroll into the courses will be crucial to the success of the venture.

As it is evident the success of FTTTDC depends both on the private sector support / commitment for employment of the passed out trainees as well as the support of the Government in utilising the capabilities of FTTTDC in the design and Implementation of policy initiatives with respect to the food sector.

10.0 CONCLUSION

FTTTDC is a critical requirement for the country. It will address the gaps in food safety and control regime and also support the food industry in the Sultanate with the infrastructure, consulting and knowledge repository base which is not currently available. The effort will also help in training the nationals to take up higher responsibilities in this sector and improve Omanisation.

The IRR on total investment for the project is 13% and the IRR in equity is 15.7%. Based on the various analyses done on the project, the project is found to be technically feasible and financially viable. However the training centre should cover all the risk factors illustrated in the report, effectively by ensuring support from the Government as well as an aggressive marketing strategy to ensure enrolment of candidates and their successful placement after completion of the course.

On the long run FTTTDC should strive and become a centre of excellence in the region attracting business from the entire GCC region.

ANNEXURE- 1

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATED PROJECT COST

S.No.	Item	Refer App.		Amount (RO)	Remarks
A1	**PROJECT COST**				
1	Land Development	1.1	79,000		
2	Building etc.	1.2	1,656,000		
3	Plant & Machinery	1.3	990,000		Estimates
4	Technical Know-How / Royalty				Considered in the expenses
5	Vehicles and Int. Transport	1.4	72,000		Estimates
6	Furniture & Office Equip.	1.5	182,000		Estimates
7	Preliminary & Pre-operative Expenses	1.6	457,000		Estimates
8	Contingency	1.7	221,000		
	Sub Total		3,657,000	**3,657,000**	
A2	**WORKING CAPITAL**		253,000	**253,000**	
A3	**TOTAL CAPITAL**			**3,910,000**	
B	**MODE OF FINANCE**				
1	Equity			1,564,000	40%
2	Term Loan from Commercial Bank			2,194,000	60%
3	Total			**3,758,000**	
4	Commercial Borrwings for Working Capital			152,000	60%
5	**TOTAL CAPITAL**			**3,910,000**	
	Total DER			1.50	

ANNEXURE- 1.1						
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)						
ESTIMATED COST OF LAND & SITE DEVELOPMENT						
S.No.	**Item**	**Unit**	**Q'ty**	**Rate**	**Amount**	**Remarks**
				(RO)	**(RO)**	
A	**LAND**					
1	Land for Institute	Sq. M	20,000	0	-	On lease
B	**SITE DEVELOPMENT**					
1	Levelling	Sq. M	17,100	0.500	4,275	
2	Compound Wall/ Fencing	M	566	35	19,799	
3	Internal Roads, Landscaping, etc.	Sq. M	1,200	10	12,000	
4	Playgrounds, etc.				20,000	
5	Gate & Misc.				3,000	Lumpsum
6	External Electro-mechanical Works				20,000	
	Sub Total				79,074	
C	**TOTAL**				**79,000**	Sum (B1 to B6)

ANNEXURE- 1.2					
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)					
ESTIMATED COST OF BUILDING & CIVIL WORKS					
S.No.	**Item**	Area	**Rate**	**Amount**	**Remarks**
		(SqM)	**(RO)**	**(RO)**	
A	**BUILDINGS**				
1	Lecture Halls	600	130	78,000	Area of 2 sqm for 300 persons
2	Seminar Hall/Amphitheatre	2,000	130	260,000	10 sqm per student for 200 students
3	Testing Laboratory	1,200	130	156,000	
4	Pilot Plant	1,200	130	156,000	
5	Other Labaratories	2,400	130	312,000	600 m2 each for 4 labs
6	Info & documentation centre (Library)	200	130	26,000	
7	Computer Lab	300	130	39,000	As per specifications
8	Registration & Admission Office	500	130	65,000	Min area required
9	Office for Academic & Admin staff	500	130	65,000	7.5 sqm per person
10	Medium size Meeting halls	250	130	32,500	
11	Meeting rooms for Departments	200	130	26,000	25 m2 eachX 8
12	Reading Rooms	110	130	14,300	
13	Canteen & Kitchen	150	130	19,500	
14	General Store	30	130	3,900	
15	Chemical Store	30	130	3,900	
16	Prayer Halls	120	130	15,600	60 m2 each for girls & boys
17	Security Building	30	130	3,900	
18	Gymnasium	200	130	26,000	
19	Clinic	50	130	6,500	
	Sub Total			**1,309,100**	
1	Electromechanical works	10,070	20	201,400	
2	Water Tanks,Borewell, pumps etc			97,000	
	Total			**1,607,500**	
B	**ENGINEERING FEES**				
1	Design			24,113	At 1.5% on building cost
2	Supervision			24,113	At 1.5% on building cost
	Sub Total			**48,225**	
D	**TOTAL**			**1,655,725**	
	TOTAL (Rounded off)			**1,656,000**	

ANNEXURE- 1.3							
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)							
ESTIMATED COST OF MACHINERY AND EQUIPMENT							
	Conversion Factors		0.008183		0.386		
S.No	**Item**	**Qty**	**Rate**	**Rate**	**Rate**	**Amount**	**Remarks**
		(Nos.)	**(INR)**	**(RO)**	**(USD)**	**(RO)**	
A	**LABORATORY EQUIPMENTS**						
1	Flash (Rotary) Evaporator with Circulating Chiller	2					Estimates
2	Nitrogen / Protein Analyser	2					
3	Gas Chromatograph System	2					
4	High Performance Liquid Chromatography System	1					
5	Atomic Absorption Spectrophotometer	2					
6	Microwave Digestion System	2					
7	UV-Visible Spectrophotometer	2					
8	Binocular Microscope	2					
9	Viscometer (Digital)	1					
10	Electronic Mettler Balance	4					
11	Millipore	2					
12	Inductively Coupled Plasma – Atomic Emission Spectrometer	1			400,000	**154,400**	
13	Distilled water unit	4					
14	Soxhlet apparatus	4					
15	Air-Oven	4					
16	Hand Refractometer	3					
17	Vacuum Oven	2					
18	Laboratory Jack	4					
19	Water Bath	4					
20	Electric Hot Plate	8					
21	Heating mantles	12					
22	Vertex mixer – speed 200-2000 rpm	4					
23	Colony counter	2					
24	Bacteriological Incubators with PID Temperature Controller	2					
25	Quartz Glass Distilled water unit	2					
26	Laminar Air flow chamber for Microbiology Lab	2					
27	Magnetic Stirrer	4					
28	Muffle furnace	2					
29	Vacuum Pump	2					
30	Centrifuge	2					
31	pH Meter	4					
32	Electronic Weighing Balance	2					
33	Auto Pipetters with disposable cartridges /tips	3					
34	Autoclave	2					
35	Fume Hood	8					
36	Island Table (3 M x 1.5 M x 0.9 M)	24			40,000	**15,440**	

	Conversion Factors		0.008183		0.386		
S.No	**Item**	**Qty**	**Rate**	**Rate**	**Rate**	**Amount**	**Remarks**
		(Nos.)	**(INR)**	**(RO)**	**(USD)**	**(RO)**	
B	**LABORATORY GLASSWARE**						
1	Silica Ware Basin round bottom with spout 45 ml	6					
2	Silica Ware Basin round bottom with spout 85 ml	6					
3	Extraction Thimbles	1 pkt					
4	Beaker 50ML, 100ML, capacities	20 each					
5	Beaker 250 ML, 500ML capacities	12 each					
6	Measuring cylinder 50ML, 100 ML, 250ML capacities	3 each					
7	Measuring cylinder with stopper 50ML, 100ML	3 each					
8	Conical flask - 50ML, 100 ML, 250 ML, 500 ML	12 each					
9	Volumetric Flask -50ML, 100ML, 250ML, 500ML	6 each					
10	Funnels - 50 MM, 65 MM , 75 MM	6 each					
11	Separating Funnel - 100ML, 250ML, 500 ML	2 each					
12	Pipettes graduated -1ML, 2 Ml, 5ML, 10ML	3 each					
13	Burettes - 10 ML, 25ML, 50ML	2 each					
14	Test tubes without rim	100					
15	Iodine Flask with stopper - 250 ML	6					
16	Iodine Flask -500 ML	2					
17	TLC Chamber jars	1					
18	Sintered Crucibles Porosity grade (1), (2) & (3) of 30ML capacity	3 each					
19	Extraction Apparatus Soxhlet complete with Allihn Condenser	6					
20	Conical flask with stopper - 50ML, 100 ML,	10 each					
21	Conical flask with stopper - 250 ML, 500 ML	6 each					
22	Wash Bottles - 1000 ML	2					
23	Markham Semi-micro distillation unit	2					
24	SO2 Determination apparatus	2					
25	Dean & Stalk Moisture determination apparatus trap	2					
26	Graduated bottles	20 box					
27	Microscopic slide	20 box					
28	Cover glass	20 box					
29	Durham tubes	100					
30	Buchner Flask	1					
31	Petri plates (with lid)	200					

	Conversion Factors		0.008183		0.386		
S.No	**Item**	**Qty**	**Rate**	**Rate**	**Rate**	**Amount**	**Remarks**
		(Nos.)	**(INR)**	**(RO)**	**(USD)**	**(RO)**	
C	**MISCELLANEOUS LABORATORY ITEMS**						
1	Iron clamps 10"						
2	Burette stand with clamps						
3	Fisher clamps 10" x 16"						
4	Enamel trays 12" x 12"						
5	Rubber Tubing 10MM, IS Grade						
6	Pinch cock, St.steel, Press type						
7	Boss Heads						
8	Pressure Tube Rubber 8MM, IS Grade						
9	Tripod stands						
10	Wire gauze 6"						
11	Glass beads						
12	Pure wool, white						
13	Moisture Dishes (Aluminum Round) 100ML cap., with lid						
14	Test tube stands						
15	Dropping bottles						
16	Cotton wool						
17	First Aid Box						
18	Gas Cylinders						
19	Bunsen Burners						
20	Sieves 8MM mesh, IS Grade						
21	Sieves 30MM mesh, IS Grade						
22	Exhaust fans						
23	Coffee Grinder – Manual (Cast iron type)						
24	Refrigerator (370 L) capacity Frost Free Double Door						
25	Mixer cum grinder						
26	Stop Watch						
27	Thermometer (0-100) & (0-250oC)						
28	Density bottles 25, 50 ml cap.						
29	Electrical plug points (5+15 ampls)						
30	Exhaust fans for walls				**10000**	**3,860**	

	Conversion Factors		0.008183		0.386		
S.No	Item	Qty	Rate	Rate	Rate	Amount	Remarks
		(Nos.)	(INR)	(RO)	(USD)	(RO)	
D	**EQUIPMENTS FOR MICROBIOLOGY LAB**						
1	Glass wares	lot	20,000				
2	Thermostaically controlled heating plates 12"x18", 2000 W	5	15,000				
3	Electronic weighing balance	2	30,000				
4	Analytical digital weighing balance	1	60,000				
5	Vertical type autoclave	2	120,000				
6	Laminar flow	2	250,000				
7	Microscopes	15	450,000				
8	Incubator	1	37,000				
9	Normal Incubator bacteriological	2	20,000				
10	Oven (thermostatic	3	100,000				
11	Shaker for 25 flasks	1	18,000				
12	pH meter (digital)	2	20,000				
13	Distillation apparatus (stoke type) 10 lit per hour 7.5 kw	1	9,000				
14	Distillation apparatus (stoke type) 4 lit per hour 4 kw	1	5,000				
15	Centrifuge	2	50,000				
16	Refrigerated centrifuge	1	120,000				
17	Water bath	2	10,000				
18	Thermometer	10	1,000				
19	Refrigerator	2	30,000				
20	Deep freezer	1	35,000				
21	S.S. Vessels	lot	5,000				
22	Gas burner	30	5,000				
23	Culture media		40,000				
24	Colony Counter with magnifying glass	2	20,000				
25	Magnetic stirrer 5 Lit capacity with speed control	2	20,000				
26	Electrophoresis	1	30,000				
27	TLC spreader	1	35,000				
	Subtotal		**1,555,000**			**12,725**	Total of items D1 to D27

	Conversion Factors		0.008183		0.386		
S.No	Item	Qty	Rate	Rate	Rate	Amount	Remarks
		(Nos.)	(INR)	(RO)	(USD)	(RO)	
E	**EQUIPMENTS FOR FOOD CHEMISTRY LAB**						
a	**Equipments**						
1	Glass wares	lot	20,000				
2	Thermostaically controlled heating plates 12"x18", 2000 W	5	15,000				
3	Electronic weighing balance	2	30,000				
4	Analytical weighing balance	2	120,000				
5	Muffle furnace	1	150,000				
6	Oven (thermostatic)	2	60,000				
7	Water bath	3	15,000				
8	Thermometer	10	1,000				
9	Distillation apparatus (stoke type): 10 Lper hour 7.5KW	1	9,000				
10	Distillation apparatus (stoke type): 4 L per hour 4KW	1	5,000				
11	Refrigerator	2	30,000				
12	Deep freezer	1	35,000				
13	Walk in cooler		500,000				
14	Soxlet apparatus	6	18,000				
15	Flash evaporator with vacuum pump and accessories	1	80,000				
16	UV spectrophotometer UV-VIS digital complete	1	160,000				
17	Micro kjeldal apparatus	1	25,000				
19	S.S. Vessels	lot	5,000				
20	Polarimeter	1	11,000				
21	Calorimeter		1,000,000				
22	Abbe refractometer		30,000				
23	Hydrometer	3	6,000				
24	Lactometer	3	3,000				
25	Magnetic stirrer 5 Lit capacity with speed control	2	20,000				
26	Heating Mantle:of flask size : 1000, 3000, 5000	2 each	10,000				
27	Tintometer (visual model Lovi bond)		250,000				
28	Melting point apparatus complete with two controls	2	5,000				
29	Auto melting point apparatus with digital display of end product	1	22,000				
30	Moisture meter: - max capacity 35 g, Accuracy 1 mg	1	120,000				
31	Conductivity meter	1	10,000				
32	pH Meter digital	2	20,000				
	Subtotal		**2,785,000**			**22,790**	

	Conversion Factors		0.008183		0.386		
S.No	Item	Qty	Rate	Rate	Rate	Amount	Remarks
		(Nos.)	(INR)	(RO)	(USD)	(RO)	
b	**Instruments Related to Food Nutrition**						
1	Skin fold calipers "Large type",		6,000				
2	Baby Infanto meter		20,000				
3	Chest depth calipers		8,000				
4	Harpenden skin fold calipers		18,000				
5	Body meter (wall mounting)		2,000				
6	Baby composition analyzer (professional model		30,000				
7	Anthropometer		90,000				
8	Infant head measuring tape		500				
9	Baby weighing scale		1,000				
10	Visceral Body Fat Monitor		80,000				
11	Stadiometer (Telescopic)		150,000				
12	Penetrometer		25,000				
13	Bomb calorimeter with digital readout		60,000				
	Subtotal		**490,500**			**4,014**	
F	**EQUIPMENTS FOR FOOD PROCESSING LAB**						
a	**Equipments**						
1	Glass wares	lot	20,000				
2	Thermostaically controlled heating plates 12"x18", 2000 W	5	15,000				
3	Electronic weighing balance	2	30,000				
4	Analytical weighing balance	1	600,000				
5	Crown corking machine: hand operated, light duty	2	5,000				
6	Seam checking Gauge (Stainless steel)	2	1,000				
7	Hand can tester with pressure Gauge	1	4,000				
8	Oven (thermostatic)	2	60,000				
9	Vacuum tester with vacuum Gauge	2	4,000				
10	pH meter digital	1	10,000				
11	Thermometer	5	500				
12	Refrigerator	1	15,000				
13	Deep freezer	1	35,000				
14	Walk in cooler		500,000				
15	S.S. Vessels	lot	50,000				
16	Hand Refractometer - Range 0-50% TSS	1	7,000				
17	Hand Refractometer - Range 40-85% TSS	1	5,000				
18	Digital Hand Pocket Refractometer- accuracy:0 - 0.1, range: 0 - 93 Brix,	1	25,000				
19	Lime Squeezer (manual)	6	150				
20	Screw type juice extractor hand operated	1	3,000				
21	Dicing & Cubing Machine:- capacity 500-100kgs/hr		200,000				
22	Potato chips machine	1	25,000				
23	De-stoner	1	1,500				
24	Kitchen Mixer (Mixi)	3	9,000				
25	Meat mincer with ½ HP motor	1	19,500				
26	Popcorn machine Domestic	1	1,100				
27	Wet grider for Dosa, vada, 3 kg	1	12,000				

	Conversion Factors		0.008183		0.386		
S.No	Item	Qty (Nos.)	Rate (INR)	Rate (RO)	Rate (USD)	Amount (RO)	Remarks
28	Mixing tank: Capacity : 200-1000 L		15,000				
29	Hammer type Pulverizer size 6" 1 HP motor	1	35,000				
30	Gas Tandoor small size	1	19,000				
31	Hand Papad Press	1	10,000				
32	Extruder - Hand operated		5,000				
33	Extruder - Electrical operated		25,000				
34	Noodle making machine, hand operated	1	4,000				
35	Solar dryer (5 kg)	1	30,000				
36	Cabinet/Tray Drier (12 trays of size 16"x32"x1.25")	1	86,000				
37	SS top working table	2	40,000				
38	SS ladle medium size	4	1,000				
39	Cutting knives: made of SS	6	800				
40	Pitting knives, coring knives, scooping knives: made of SS	2 each	500				
41	Glass Bottles:	lot	1,900				
42	Caps	lot	700				
43	Plastic Mugs (Food grade)	5	150				
44	Plastic Jugs (Graduated): 1 L and 2 L capacity	2 each	400				
45	Stove with LPG	1	3,000				
46	Pouch Sealing Machine – Hand / Foot operated		2,500				
47	Crown corking machine	1	6,000				
48	PP cap sealing machine: pedestal model	1	12,000				
49	Lug capping machine hand operated table model		10,000				
	Subtotal		**1,965,700**			**16,085**	
b	**Bakery Machines**						
1	Cake Mixer Double speed: Cap 10 kg	1	30,000				
2	Dough Kneader: Capacity 10 kg	1	30,000				
3	Bread Slicer (12"): 21 blades	1	23,500				
4	Dough sheeter	1	100,000				
5	Oven- electrically operated	1	58,000				
6	Bread moulder: capacity 500 pcs/hr	1	44,000				
7	Moulds for bread (set of three) 200 g	10 set	1,800				
8	Biscuit Trays: 12"x16"	12	1,500				
9	Cake moulds Aluminium: set of 3 in diff shapes	5 sets	2,000				
10	Icing gun	3	1,000				
11	Icing bag	3	600				
12	Cream Roll Pipe	6	250				
13	Bread cooling rack	2	40,000				
	Subtotal		**332,650**			**2,722**	

	Conversion Factors		0.008183		0.386		
S.No	Item	Qty	Rate	Rate	Rate	Amount	Remarks
		(Nos.)	(INR)	(RO)	(USD)	(RO)	
G	**EQUIPMENT FOR INSTRUMENTATION LAB**						
1	HPLC	1	2,500,000				
2	CG and GCMS	1	5,000,000				
3	LCMS	1	20,000,000				
4	Rheometer	1	800,000				
5	Centrifuge	1	150,000				
6	Spectrophotometer	1	600,000				
7	pH meter	1	15,000				
8	Refrigerator	1		200		**200**	
9	Food Texture analyzer	2	1,000,000				
10	Farinograph	1	1,800,000				
11	Amylograph	1	1,600,000				
12	Extensograph	1	1,500,000				
13	Calorimeter	1	1,000,000				
	Subtotal		**35,965,000**			**294,302**	
H	**PILOT PLANT**						
a	**Processing Equipment**						
1	Fruit mill		50,000				
2	Fruit Pulper		45,000				
3	Screw juice extractor		100,000				
4	Potato Peeler		50,000				
5	Pineapple Slicer		150,000				
6	Sieving and Straining Machine		120,000				
7	Hydraulic Press		80,000				
8	Blanching Equipment		40,000				
9	Steam Jacketed Kettles		125,000				
10	Autoclave		80,000				
11	Cooling Tank		35,000				
12	Cross Flow Dryer		125,000				
13	Vibro Screen		100,000				
14	Hammer Mill		120,000				
15	Vibro fluidized bed roaster		200,000				
16	Mini dhal mill		120,000				
17	Mini grain mill		150,000				
18	Mini Bakery Unit		600,000				
19	Planetary mixer		120,000				
	Subtotal		**2,410,000**			**19,721**	
b	**Packaging Machinery**						
	Capping machine		30,000				
	Crown corking machine		5,000				
	Exhaust box		150,000				
	Can reformer		100,000				
	Can Flanger		100,000				
	Can Seamer		100,000				
	Subtotal		**485,000**			**3,969**	

	Conversion Factors		0.008183		0.386		
S.No	**Item**	**Qty**	**Rate**	**Rate**	**Rate**	**Amount**	**Remarks**
		(Nos.)	**(INR)**	**(RO)**	**(USD)**	**(RO)**	
c	**Accessories**						
	Steam Generator with accessories		800,000				
	Weighing balance 150 kg and 15 kg		75,000				
	Walk-in cooler		500,000				
	Diesel Generator Set		0				
	Accessories like pumps, table etc.		150,000				
	Refractometer 0 – 40		5,000				
	Refractometer 40 - 91		5,000				
	Pineapple punch		500				
	Pineapple corer		1,000				
	Hand held temperature indicators		5,000				
	Hand stirrer/ blender		3,000				
	Table grinder (Mixie)			75			
	Steel Almirah for spares			75			
	Plastic crates, buckets and mugs.			150			
	Stainless steel Knives			100			
	Ladles/ spatula			100			
	Drinking water cooler			200			
	Other miscellaneous items			1,000			
						1,700	Total of E322 to 328
	Subtotal		**1,544,500**			**12,639**	
	Add for cost of import					**168,860**	30% of cost of machinery
I	Landed cost of machinery					**733,425**	
J	Packing & Forwarding					**36,671**	5% of cost of Machines
K	Transportation & installation					**22,003**	3% of cost of machinery
	Total					**792,099**	
	Total with additional contingency of 25%					**990,124**	
	SAY					**990,000**	

ANNEXURE- 1.4

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATED COST OF VEHICLES & INTERNAL TRANSPORT

S.No	Item	Q'ty (Nos.)	Rate	Amount (RO)	Remarks
A	**VEHICLES**				
1	Saloon Car	3	12,000	36,000	For office use
2	Mini Bus			-	Outsourced
3	Bus			-	Outsourced
4	Pickup Van	3	12,000	36,000	For office use
	Sub Total			**72,000**	
	Say			**72,000**	

ANNEXURE- 1.5

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATED COST OF FURNITURE & OFFICE EQUIPMENT

S.No.	Item	Q'ty	Rate (RO)	Amount (RO)	Remarks
A	**OFFICE AND TRAINING CENTRE**				
1	Audio Visual Facility for Seminar Halls	1	3,000	3,000	Lumpsum
2	Cushion armed Chairs	100	40	4,000	Estimate
3	Lab working table with 4 drawers for 4 students	25	50	1,250	Estimate
4	Table fixed with wall for placing the equipments for instrumentation lab	1	300	300	Estimate
5	Revolving stools	100	35	3,500	Estimate
6	Revolving stools with adjustable heights	25	40	1,000	Estimate
7	Central Racks	120	200	24,000	Estimate
8	LPG Gas connection with burners- set	4	50	200	Estimate
9	Chemical Racks	12	200	2,400	Estimate
10	Long table	7	50	350	
11	Office table	64	50	3,200	
12	Executive chairs	64	50	3,200	
13	Chairs	180	35	6,300	
14	Chairs with writing facility	300	50	15,000	
15	LCD Projector	25	195	4,875	
16	OHP	25	200	5,000	
17	White Screen	25	50	1,250	
18	White Board	29	50	1,450	
19	White Board Marker	23	5	115	
20	Chalk Board	18	50	900	
21	Computer & table	50	200	10,000	
22	Printer	50	120	6,000	
23	Book shelf	69	50	3,450	
24	File drawer	69	75	5,175	
25	Telephone & fax	13	10	130	
26	Photo Copier	13	500	6,500	
27	Spiral Binding	3	50	150	
28	Laser pointer	50	10	500	
29	Podium	20	50	1,000	
30	Plasma TV	20	250	5,000	
31	Library books & equipments			50,000	
32	Steel Almirah	101	80	8,080	
33	Curtain, carpet etc (Set)	90	50	4,500	
	Total			**181,775**	
	Total (Rounded off)			**182,000**	

ANNEXURE- 1.6				
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)				
ESTIMATE OF PRE-OPERATIVE EXPENSES				
S.No	**Item**		**Amount**	**Remarks**
		(RO)	**(RO)**	
1	Preliminary Expenses		100,000	Lumpsum
2	Feasibility Studies & Consultancy expenses		15,000	
3	Fees for establishing FTTTDC (Incl. Project Manageemnt)		120,000	24 months@ RO 5000 per month
4	Cost on Employees			
a	Salary & benefits - CEO	16,200		6 months prior to start of operation
b	Salary & benefits - Faculty	22,050		1 month prior to start of operation
c	Salary & benefits - Admin. Staff	13,215		1 month prior to start of operation
d	Salary & benefits - Sales Staff	4,680		3 month prior to start of operation
	Sub Total		56,145	
e	Visa, Passage etc.		25200	@ RO 1200 per expatriate employee
5	Financing Cost			
a	Loan Interest	65,886		For 12 months
b	Mortgage & Gurantee Expenses	21,940		At 1% on Institu: Loan
c	Other Bank Charges	3,000		
	Sub Total		90,826	
6	Training Expenses		50,000	
	Total		**457,171**	
	Total (Rounded off)		**457,000**	

ANNEXURE- 1.7

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATES OF CONTINGENCY AND ESCALATION

S.No.	Item	Cost (RO)	Rate (%)	Provision (RO)	Remarks
A	**FIXED ASSETS**				
1	Land Development	79,000	5.0	3,950	
2	Building etc.	1,656,000	5.0	82,800	
3	Plant & Machinery	990,000	10.0	99,000	
4	Technical Know-How / Royalty	-	5.0	-	
5	Vehicles and Int. Transport	72,000	5.0	3,600	
6	Furniture & Office Equip.	182,000	5.0	9,100	
7	Preliminary & Pre-operative Expenses	457,000	5.0	22,850	
	TOTAL			221,300	
	Say			**221,000**	

ANNEXURE- 1.8							
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)							
ESTIMATES OF WORKING CAPITAL REQUIREMENTS							
S.No.	**Item**	**Req.**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Remarks**
				In RO			
1	Acct. Receivable	2 Months	162	185	216	217	Cost of sales - Non C Ex.
2	Consumable & Franchise fee	2 Months	20	26	33	35	Procured on daily basis
3	Utilities	1 Month	3	4	5	5	
4	Salaries	1 Month	30	36	41	42	
5	Admn. Expenses	1 Month	17	18	22	22	
6	Marketing Expenses	1 Month	2	2	2	2	
7	Overheads	1 Month	7	8	10	10	
8	Finance Cost	1 Month	12	12	11	10	At Finance Cost
9	Total		253	290	340	343	
	Say		**253**	**290**	**340**	**343**	

ANNEXURE- 2

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

COST OF OPERATION

	Year of Operation		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Long Term Trainees per year		47	61	77	67	71	74	78	82	86	90	
	Short Term Trainees per year		293	359	431	453	475	499	524	550	578	607	
No	**Item**	**In RO '000**											**Remarks**
1	Cost of consumable-		96	128	161	176	180	184	188	191	196	200	Ref. Annexure 2.1
2	Franchise cost	5%	23	29	36	35	36	38	40	42	44	46	
3	Utilities		39	52	65	57	60	63	66	69	73	76	Ref. Annexure 2.2
4	Salaries (Faculty)		365	427	490	499	512	525	538	551	565	579	
5	**PRIME COST**		**523**	**636**	**752**	**767**	**788**	**810**	**831**	**854**	**878**	**902**	Sub total of 1 to 4
6	Overheads		58	77	95	100	105	110	115	121	127	133	
7	Rent- land		20	20	20	20	20	23	23	23	23	23	
8	**Factory Cost**		**601**	**732**	**867**	**887**	**913**	**942**	**970**	**998**	**1,028**	**1,058**	
9	Admin. Salaries		166	170	222	229	234	240	246	252	259	265	
10	Admin. Expenses		41	41	41	41	41	41	41	41	41	41	
11	Total Admin expenses		206	211	263	269	275	281	287	293	299	306	
12	Marketing Salaries		19	19	23	20	21	21	22	23	23	24	
13	Advert.& Business Promotion		6	6	6	6	6	6	6	6	6	6	
14	Total sales & dist: costs		25	25	29	26	27	27	28	29	29	30	Sum of (11 to 13)
15	**OPERATING COST**		**832**	**969**	**1,158**	**1,182**	**1,215**	**1,251**	**1,285**	**1,320**	**1,356**	**1,394**	Sum(8)+(11)+(14)
16	Int on term loan		132	132	128	111	95	78	62	45	29	12	Ref Annexure 2.8
17	Int on working capital		9	9	9	9	9	9	9	9	9	9	Ref Annexure 2.8
18	Total finance cost		141	141	137	120	104	87	71	54	38	21	Sum(16)+(17)
19	Depreciation		155	155	155	155	155	155	155	155	155	155	Ref Annexure 2.7
20	Prelim Expenses written off		457	0	0	0	0	0	0	0	0	0	Ref Annexure 2.7
21	**COST OF OPERATION**		**1,585**	**1,264**	**1,450**	**1,458**	**1,474**	**1,493**	**1,510**	**1,529**	**1,549**	**1,570**	Sum15+18+19+20

ANNEXURE 2.1

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

COST OF CONSUMABLES

	Course/Expenditure	1	2	3	4	5	6	7	8	9	10
1	**Semiskilled Operator course for fresh employment - 1 Year**										
	No. of trainees/ year	23	31	38	34	35	37	39	41	43	45
	Consumable- per year per trainee	40	40	40	40	50	50	50	50	50	50
	Consumable- Long term Courses per year	931	1,222	1,540	1,347	1,768	1,857	1,950	2,047	2,149	2,257
2	**Skilled Operator Course for fresh employment- 2 Years**										
	No. of trainees/ year	23	31	38	34	35	37	39	41	43	45
	Consumable- per year per trainee	60	60	60	60	60	60	60	60	60	60
	Consumable- Long term Courses per year	1,397	1,833	2,310	2,021	2,122	2,228	2,340	2,457	2,579	2,708
3	**Craftsman Course (Skill Upgradation) - 3 months**										
	No. of trainees/ year	147	180	216	226	238	250	262	275	289	303
	Consumable per course per trainee	120	120	120	120	120	120	120	120	120	120
	Consumable-short term Courses per year	17,598	21,557	25,869	27,162	28,520	29,946	31,444	33,016	34,667	36,400
4	**Short Term Training Programme (2-4 weeks)**										
	No. of trainess	147	180	216	226	238	250	262	275	289	303
	Consumable per trainee	15	15	15	15	15	15	15	15	15	15
	Consumable-short term Courses per year	2,200	2,695	3,234	3,395	3,565	3,743	3,930	4,127	4,333	4,550
5	**Entrepreneurial Development Programme (3 months)**										
	No of trainees per year	0	0	5	5	5	5	5	5	5	5
	Consumable per trainee	80	80	80	80	80	80	80	80	80	80
	Consumable-short term Courses per year	0	0	400	400	400	400	400	400	400	400
6	**Incubation services**										
	No of service per year	2	3	4	5	5	5	5	5	5	5
	Consumable per service	500	500	500	500	500	500	500	500	500	500
	Consumable per year	1,000	1,500	2,000	2,500	2,500	2,500	2,500	2,500	2,500	2,500
7	**Third Party inspection Services for the Government**										
	No of inspection per year	2,400	3,600	4,800	6,000	6,000	6,000	6,000	6,000	6,000	6,000
	Consumable per inspection test	10	10	10	10	10	10	10	10	10	10
	Consumable per year	24,000	36,000	48,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000

ANNEXURE 2.1

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

COST OF CONSUMABLES

	Course/Expenditure	1	2	3	4	5	6	7	8	9	10
8	**Chemical analysis of cereals, pulses etc**										
	No. of trainess	180	240	300	300	300	300	300	300	300	300
	Consumable per trainee	10	10	10	10	10	10	10	10	10	10
	Consumable-short term Courses per year	1,800	2,400	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
9	**Chemical analysis of oils & fats**										
	No. of job orders	240	360	480	480	480	480	480	480	480	480
	Average consumable per job order	15	15	15	15	15	15	15	15	15	15
	Consumable cost for Mould Design & Manufacturing	3,600	5,400	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200
10	**Chemical analysis of milks & milk products**										
	No. of job orders	240	360	480	480	480	480	480	480	480	480
	Consumable per job order	10	10	10	10	10	10	10	10	10	10
	Consumable for analysis	2,400	3,600	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800
11	**Chemical analysis of Mineral water, fruit juices & drinks**										
	No. of job orders	480	600	720	720	720	720	720	720	720	720
	Consumable per job order	8	8	8	8	8	8	8	8	8	8
	Consumable for analysis	3,600	4,500	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
12	**Microbial analysis**										
	No. of job orders	600	800	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Consumable per job order	15	15	15	15	15	15	15	15	15	15
	Consumable for analysis	9,000	12,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
13	**Food Processing assignments - Private Sector**										
	No. of job orders	20	25	30	30	30	30	30	30	30	30
	Consumable per job order	300	300	300	300	300	300	300	300	300	300
	Consumable for analysis	6,000	7,500	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
14	**Consultancy & Advisory Services including Codex and Other International Liasioning work from the Government**										
	No. of job orders	5	7	10	15	20	20	20	20	20	20
	Consumable per job order	25	25	25	25	25	25	25	25	25	25
	Consumable for analysis	125	175	250	375	500	500	500	500	500	500
	Total cost of consumable	**73,650**	**100,382**	**128,002**	**141,601**	**143,776**	**145,574**	**147,463**	**149,446**	**151,529**	**153,715**
	Cost of consumables for training	**22,125**	**27,307**	**33,352**	**34,326**	**36,376**	**38,174**	**40,063**	**42,046**	**44,129**	**46,315**

ANNEXURE- 2.2

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATED COST OF UTILITIES

S.No.	Item	Unit	Qty	Rate	Amount (RO)	Remarks
	UTILITIES					
1	Electricity- For Machines	KWH	72,000	0.030	2,160	
2	Electricity- Office & workshops, lab, etc.	KWH	2,083,200	0.030	62,496	
3	Electricity- Others	KWH	37,800	0.030	1,134	
4	Water- General Consumption	KL	13,660	0.770	10,518	
	TOTAL				**76,308**	

ANNEXURE- 2.3.1

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

ESTIMATES OF ANNUAL SALARIES AND WAGES (For First Year)

S.No.	Item	No of personnel		Salary (RO)		Amount	Remarks
		Omani	Expat	Omani	Expat	(RO)	
A	**FACULTY**						
1	Principal	1	0	3000		36,000	
2	Head of Departments	2	3	1800	1500	97,200	
3	Faculty-Middle level		0	1200		-	
4	Faculty-Junior	2	2	1000	800	43,200	
5	Excecutive Consulatant		1	0	1000	12,000	
6	Consultants		2		850	20,400	
7	Lab Technicians/Instructors	4	8	500	500	72,000	
	Subtotal	**9**	**16**			**280,800**	
	Add: Fringe benefits - at 30% of basic					84,240	
	Total Manpower Cost (Faculty)	9	16			**365,040**	
B	**ADMINISTRATION & ACCOUNTS**						
1	Registrar	1		1800		21,600	
2	Counsellor	2		1200		28,800	
3	Accountant	1		850		10,200	
4	Librarian	1		700		8,400	
5	Maitenance staff	1	1	400	350	9,000	
6	Driver	3		450		16,200	
7	Receptionist/ Secretary	1		350		4,200	
8	Nurse	1	1	350	350	8,400	
9	Attenders/ Cleaners/ Gardeners		3	0	120	4,320	
10	Security Guard	3		450		16,200	
	Sub Total	**14**	**5**			**127,320**	
	Add: Fringe benefits - at 30% of basic					38,196	
	Total Admn. Manpower Cost	**14**	**5**			**165,516**	
C	**MARKETING**						
1	Business Development Manager	1		1200		14,400	
	Subtotal- Marketing Dept.					14,400	
	Add: Fringe benefits - at 30% of basic					4,320	
	Total Marketing Manpower Cost	**1**	**0**			**18,720**	
D	**GRAND TOTAL**	**24**	**21**			**549,276**	

S.No.	Item	No of personnel		Salary (RO)		Amount	Remarks
		Omani	Expat	Omani	Expat	(RO)	
ESTIMATES OF ANNUAL SALARIES AND WAGES (For the Second Year)							
S.No.	Item		No of personnel	Salary (RO)		Amount	Remarks
A	**FACULTY**						
1	Principal	1	0	3090		37,080	
2	Head of Departments	2	3	1854	1545	100,116	
3	Faculty-Middle level	1	0	1236		14,832	
4	Faculty-Junior	2	2	1030	824	44,496	
5	Excecutive Consulatant	0	1		1030	12,360	
6	Consultants	0	2		876	21,012	
7	Lab Technicians	8	8	515	515	98,880	
	Subtotal	**14**	**16**			**328,776**	
	Add: Fringe benefits - at 30% of basic					98,633	
	Total Manpower Cost (Faculty)	**14**	**16**			**427,409**	
B	**ADMINISTRATION & ACCOUNTS**						
1	Registrar	1	0	1854		22,248	
2	Counsellor	2	0	1236		29,664	
3	Accountant	1	0	876		10,506	
4	Librarian	1	0	721		8,652	
5	Maitenance staff	1	1	412	361	9,270	
6	Driver	3	0	464		16,686	
7	Receptionist/ Secretary	1	0	361		4,326	
8	Nurse	1	1	361	361	8,652	
9	Attenders/ Cleaners/ Gardeners	0	3	0	124	4,450	
10	Security Guard	3	0	464		16,686	
	Sub Total	**14**	**5**			**131,140**	
	Add: Fringe benefits - at 30% of basic					39,342	
	Total Admn. Manpower Cost	**14**	**5**			**170,481**	
C	**MARKETING**						
1	Business Development Manager	1	0	1236		14,832	
	Subtotal- Marketing Dept.	**1**	**0**			**14,832**	
	Add: Fringe benefits - at 30% of basic					4,450	
	Total Marketing Manpower Cost	**1**	**0**			**19,282**	
D	**GRAND TOTAL**	**29**	**21**			**617,172**	

S.No.	Item	No of personnel		Salary (RO)		Amount	Remarks
		Omani	Expat	Omani	Expat	(RO)	
ESTIMATES OF ANNUAL SALARIES AND WAGES (For the Third Year Year)							
S.No.	Item		No of personnel	Salary (RO)		Amount (RO)	Remarks
A	**FACULTY**						
1	Principal	1	0	3183		38,192	
2	Head of Departments	2	3	1910	1591	103,119	
3	Faculty-Middle level	1	0	1273		15,277	
4	Faculty-Junior	3	2	1061	849	58,562	
5	Excecutive Consulatant	0	1	0	1061	12,731	
6	Consultants	0	2	0	902	21,642	
7	Lab Technicians	10	10	530	530	127,308	
	Subtotal	**17**	**18**			**376,832**	
	Add: Fringe benefits - at 30% of basic					113,050	
	Total Manpower Cost (Faculty)	**17**	**18**			**489,881**	
B	**ADMINISTRATION & ACCOUNTS**						
1	Registrar	1	0	1910		22,915	
2	Counsellor	2	0	1273		30,554	
3	Accountant	3	0	902		32,464	
4	Librarian	2	0	743		17,823	
5	Maitenance staff	2	1	424	371	14,640	
6	Driver	3	0	477		17,187	
7	Receptionist/ Secretary	1	0	371		4,456	
8	Nurse	1	1	371	371	8,912	
9	Attenders/ Cleaners/ Gardeners	0	3		127	4,583	
10	Security Guard	3	0	477		17,187	
	Sub Total	**18**	**5**			**170,720**	
	Add: Fringe benefits - at 30% of basic					51,216	
	Total Admn. Manpower Cost	**18**	**5**			**221,936**	
C	**MARKETING**						
1	Business Development manager	1	0	1273		15,277	
	Subtotal- Marketing Dept.	**1**	**0**			**15,277**	
	Add: Fringe benefits - at 50% of basic					7,638	
	Total Marketing Manpower Cost	**1**	**0**			**22,915**	
D	**GRAND TOTAL**	**36**	**23**			**734,733**	

S.No.	Item	No of personnel		Salary (RO)		Amount	Remarks
		Omani	Expat	Omani	Expat	(RO)	
ESTIMATES OF ANNUAL SALARIES AND WAGES (For the Fourth Year)							
S.No.	**Item**		**No of personnel**	**Salary (RO)**		**Amount (RO)**	**Remarks**
A	**FACULTY**						
1	Principal	1	0	3278	0	39,338	
2	Head of Departments	2	3	1967	1639	106,213	
3	Faculty-Middle level	1	0	1311	0	15,735	
4	Faculty-Junior	5	0	1093	874	65,564	
5	Excecutive Consulatant	0	1	0	1093	13,113	
6	Consultants	0		0	0	-	
7	Lab Technicians	14	8	546	546	144,240	
	Subtotal	**23**	**12**			**384,203**	
	Add: Fringe benefits - at 30% of basic					115,261	
	Total Manpower Cost (Faculty)	**23**	**12**			**499,464**	
B	**ADMINISTRATION & ACCOUNTS**						
1	Registrar	1	0	1967		23,603	
2	Counsellor	2	0	1311		31,471	
3	Accountant	3	0	929		33,437	
4	Librarian	2	0	765		18,358	
5	Maitenance staff	2	1	437	382	15,080	
6	Driver	3	0	492		17,702	
7	Receptionist/ Secretary	1	0	382		4,589	
8	Nurse	1	1	382	382	9,179	
9	Attenders/ Cleaners/ Gardeners	0	3		131	4,721	
10	Security Guard	3	0	492		17,702	
	Sub Total	**18**	**5**			**175,842**	
	Add: Fringe benefits - at 30% of basic					52,752	
	Total Admn. Manpower Cost	**18**	**5**			**228,594**	
C	**MARKETING**						
	MARKETING						
1	Business Development manager	1	0	1311		15,735	
	Subtotal- Marketing Dept.	**1**	**0**			**15,735**	
	Add: Fringe benefits - at 30% of basic					4,721	
	Total Marketing Manpower Cost	**1**	**0**			**20,456**	
D	**GRAND TOTAL**	**42**	**17**			**748,514**	

ANNEXURE- 2.4					
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)					
ESTIMATES OF ANNUAL OVERHEAD EXPENSES					
S.No.	**Item**	**Year**	**Year**	**Year**	**Remarks**
		1	**2**	**3**	
1	Repairs & Maintenance	9900	19800	29700	At 1%, 2% and 3% of erected cost of plant and machinery for year 1, 2 and 3 respectively
2	Civil Repairs	16,560	24,840	33,120	At 1%, 1.5% and 2% of cost of building for year 1, 2 and 3 respectively
3	Insurance	32,000	32,000	32,000	At 0.1% of cost fixed assets
4	**TOTAL**	**58,460**	**76,640**	**94,820**	

ANNEXURE- 2.5				
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)				
ESTIMATES OF ANNUAL ADMINISTRATIVE EXPENSES				
S.No.	**Item**		**Amount**	**Remarks**
		(RO)	**(RO)**	
	ADMINISTRATION			
1	Salaries & Benefits		170,481	
2	Vehicle Expenses & Petrol			
3	Communication expenses		3,600	At RO 300 /Month
4	Legal, Audit Fees		5,000	Lumpsum
5	Printing & Stationery		12,000	At RO 1000 /Month
6	Passage		-	Incl. in Staff Benefits
7	Staff Accomodation			Incl. in Staff Benefits
8	Travelling Expenses		5,000	Lumpsum
9	Registrations/ Approvals		5,000	Lumpsum
10	Miscellaneous Expenses		10,000	Lumpsum
	Total (excluding salaries)		**40,600**	

ANNEXURE- 2.6

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

DEPRECIATION CALCULATIONS

	Item	Cost	Rate (%)	S.V. (RO)	Amount (RO)	Renewals
A	**FIXED ASSETS**					
1	Land Development	79,000	0.0	0	0	Nil
2	Building etc.	1,738,800	2.5	1,304,100	43,470	Nil
3	Plant & Machinery	1,089,000	5.0	544,500	54,450	Year 11
4	Technical Know-How / Royalt	0	10.0	0	0	Nil
5	Vehicles and Int. Transport	75,600	25.0	37,800	18,900	Years 5, 9
6	Furniture & Office Equip.	191,100	20.0	0	38,220	Years 6, 11
7						
8	Sub Total	3,173,500		1,886,400	**155,040**	

ANNEXURE- 2.7

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

LOAN & INTEREST CALCULATION

		Working Capital Loan		TERM LOAN			Annual	
No	**Year**	**Prn**	**Int**	**Prn**	**Int**	**Rep**	**Int**	**Rep**
1		152	4.6	2194	66	0		
2	1	152	4.6	2194	66	0	**141**	**0**
3		152	4.6	2194	66	0		
4	2	152	4.6	2194	66	0	**141**	**0**
5		152	4.6	2194	66	137		
6	3	152	4.6	2057	62	137	**137**	**274**
7		152	4.6	1920	58	137		
8	4	152	4.6	1783	53	137	**120**	**274**
9		152	4.6	1646	49	137		
10	5	152	4.6	1508	45	137	**104**	**274**
11		152	4.6	1371	41	137		
12	6	152	4.6	1234	37	137	**87.3**	**274**
13		152	4.6	1097	33	137		
14	7	152	4.6	960	29	137	**70.8**	**274**
15		152	4.6	823	25	137		
16	8	152	4.6	686	21	137	**54.4**	**274**
17		152	4.6	549	16	137		
18	9	152	4.6	411	12	137	**37.9**	**274**
19		152	4.6	274	8	137		
20	10	152	4.6	137	4	137	**17.3**	**274**

ANNEXURE- 3												
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)												
ESTIMATED WORKING RESULTS												
	Year of Operation	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Long Term Trainees per year	47	61	77	67	71	74	78	82	86	90	
	Short Term Trainees per year	293	359	431	453	475	499	524	550	578	607	
No	**Item**	**Figures in RO '000**										**Remarks**
1	**Operating Cost**	832	969	1,158	1,182	1,215	1,251	1,285	1,320	1,356	1,394	Ref Annexure 2
2	Expected Revenue *											
a	Training	457	575	712	695	729	765	803	843	884	928	Ref Annexure 3.1
b	Other Services	584	821	1,079	1,259	1,309	1,309	1,309	1,309	1,309	1,309	Ref Annexure 3.1
c	Total	1,041	1,396	1,791	1,954	2,038	2,074	2,112	2,152	2,193	2,237	Sum of (2a+2b)
3	**Profit before Int & dep**	**208**	**427**	**633**	**771**	**823**	**824**	**827**	**832**	**837**	**844**	Sum of (2-1)
4	Depreciation	155	155	155	155	155	155	155	155	155	155	
5	Finance Cost	141	141	137	120	104	87	71	54	38	21	
6	**Operating profit**	**-88**	**131**	**341**	**496**	**564**	**581**	**602**	**623**	**644**	**667**	Sum of (3 - 4 - 5)
7	Other income if any											
8	Prelim Expenses written off	457	0	0	0	0	0	0	0	0	0	
9	Profit/Loss before tax	-545	131	341	496	564	581	602	623	644	667	Sum of (6 - 7 - 8)
10	Income Tax	0	0	0	0	0	87	90	93	97	100	
11	**Profit after tax**	**-545**	**131**	**341**	**496**	**564**	**494**	**511**	**529**	**548**	**567**	
12	Statutory reserve	0	13	34	50	56	49	51	53	55	57	
13	Profit for appropriation	-545	118	307	447	508	445	460	476	493	510	
14	Dividend	0	0	0	0	0	0	0	0	0	0	
15	General reserve	-545	118	307	447	508	445	460	476	493	510	Difference (13) - (14)
16	**Net cash accruals**	**67**	**286**	**496**	**651**	**720**	**649**	**666**	**684**	**703**	**722**	

ANNEXURE 3.1											
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)											
CALCULATION OF INCOME											
		1	2	3	4	5	6	7	8	9	10
	Estimated total National workforce in technical areas in the sector	**2,444**	**2,566**	**2,695**	**2,829**	**2,971**	**3,119**	**3,275**	**3,439**	**3,611**	**3,792**
	Estimated additional National workforce in technical areas in the sector	**116**	**122**	**128**	**135**	**141**	**149**	**156**	**164**	**172**	**181**
A	**Course/ Fees/ Income**										
1	**Semiskilled Operator course for fresh employment - 1 Year**										
	% of additional employment	20%	25%	30%	25%	25%	25%	25%	25%	25%	25%
	No. of students/ year	23	31	38	34	35	37	39	41	43	45
	Fees- per year per student (RO)	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
	Income (RO)	**90,782**	**119,152**	**150,131**	**131,365**	**137,933**	**144,829**	**152,071**	**159,674**	**167,658**	**176,041**
2	**Skilled Operator Course for fresh employment- 2 Years**										
	% of additional employment	20%	25%	30%	25%	25%	25%	25%	25%	25%	25%
	No. of students/year	23	31	38	34	35	37	39	41	43	45
	Fees per course per trainee	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
	Income (RO)	90,782	119,152	150,131	131,365	137,933	144,829	152,071	159,674	167,658	176,041
3	**Craftsman Course (Skill Upgradation) - 3 months**										
	% of Total employment	6%	7%	8%	8%	8%	8%	8%	8%	8%	8%
	No. of students/ year	147	180	216	226	238	250	262	275	289	303
	Fees- per year per student (RO)	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125
	Income (RO)	164,979	202,099	242,519	254,645	267,377	280,746	294,784	309,523	324,999	341,249
4	**Short Term Training Programme (2-4 weeks)**										
	% of Total employment	6%	7%	8%	8%	8%	8%	8%	8%	8%	8%
	No. of trainees / year	147	180	216	226	238	250	262	275	289	303
	Fees per course per trainee	750	750	750	750	750	750	750	750	750	750
	Income (RO)	109,986	134,733	161,679	169,763	178,252	187,164	196,522	206,348	216,666	227,499
5	**Entrepreneurial Development Programme (3 months)**										
	No. of trainees / year			5	5	5	5	5	5	5	5
	Fees per course per trainee			1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
	Fees per course per trainee			7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
	Total no. of students / trainees in an year	340	420	508	520	546	573	602	632	664	697
	Total Income From Training Courses	**456,529**	**575,135**	**711,960**	**694,638**	**728,994**	**765,069**	**802,948**	**842,720**	**884,481**	**928,330**
	Tests/Analysis/Services										
6	**Incubation services**										
	No. of Incubation services	2	3	4	5	5	5	5	5	5	5
	Average income per service	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

ANNEXURE 3.1

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

CALCULATION OF INCOME

		1	2	3	4	5	6	7	8	9	10
	Annual Income	**20,000**	**30,000**	**40,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**
7	**Third Party inspection Services for the Government**										
	No. of job orders	2,400	3,600	4,800	6,000	6,000	6,000	6,000	6,000	6,000	6,000
	Average income per job order	100	100	100	100	100	100	100	100	100	100
	Income	**240,000**	**360,000**	**480,000**	**600,000**	**600,000**	**600,000**	**600,000**	**600,000**	**600,000**	**600,000**
8	**Chemical analysis of cereals, pulses etc**										
	No. of job orders	180	240	300	300	300	300	300	300	300	300
	Average income per job order	100	100	100	100	100	100	100	100	100	100
	Income	**18,000**	**18,000**	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**
9	**Chemical analysis of oils & fats**										
	No. of job orders	240	360	480	480	480	480	480	480	480	480
	Average income per job order	150	150	150	150	150	150	150	150	150	150
	Income	**36,000**	**54,000**	**72,000**	**72,000**	**72,000**	**72,000**	**72,000**	**72,000**	**72,000**	**72,000**
10	**Chemical analysis of milks & milk products**										
	No. of job orders	240	360	480	480	480	480	480	480	480	480
	Average income per job order	100	100	100	100	100	100	100	100	100	100
	Income from Processing Assignment	**24,000**	**36,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**
11	**Chemical analysis of Mineral water, fruit juices & drinks**										
	No. of Assignments	480	600	720	720	720	720	720	720	720	720
	Average Charges/ Assignment	75	75	75	75	75	75	75	75	75	75
	Income	**36,000**	**45,000**	**54,000**	**54,000**	**54,000**	**54,000**	**54,000**	**54,000**	**54,000**	**54,000**
12	**Microbial analysis**										
	No. of Assignments	600	800	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
	Average Charges/ Assignment	150	150	150	150	150	150	150	150	150	150
	Income	**90,000**	**120,000**	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**
13	**Food Processing assignments - Private Sector**										
	No of assignments	20	25	30	30	30	30	30	30	30	30
	Fees per assignment	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
	Income	**70,000**	**87,500**	**105,000**	**105,000**	**105,000**	**105,000**	**105,000**	**105,000**	**105,000**	**105,000**
14	**Consultancy & Advisory Services including Codex and Other International Liasioning work from the Government**										
	No of assignments	5	7	10	15	20	20	20	20	20	20
	Fees per assignment	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
	Income	**50,000**	**70,000**	**100,000**	**150,000**	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**
	Income from tests/analysis	**584,000**	**820,500**	**1,079,000**	**1,259,000**	**1,309,000**	**1,309,000**	**1,309,000**	**1,309,000**	**1,309,000**	**1,309,000**
	Grand Total Income	**1,040,529**	**1,395,635**	**1,790,960**	**1,953,638**	**2,037,994**	**2,074,069**	**2,111,948**	**2,151,720**	**2,193,481**	**2,237,330**

ANNEXURE- 4

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

PROJECTED CASH FLOW STATEMENT

	Year of Operation		1	2	3	4	5	6	7	8	9	10	
No	**Item**	**In RO '000**											**Remarks**
A	**CASH INFLOW**												
1	Equity	1,564	0	0	0	0	0	0	0	0	0	0	Ref Annexure 1
2	Term Loan from Bank	2,194											
3	Profit bef tax & int		-404	272	478	616	668	668	672	677	682	688	Ref Annexure 3
4	Depreciation	0	155	155	155	155	155	155	155	155	155	155	Ref Annexure 2.7
5	Prel exp written off		457	0	0	0	0	0	0	0	0	0	Ref Annexure 2.7
6	Increase in W C loan	152		0	0	0	0	0	0	0	0	0	Ref Annexure 1
7	Other income	0											Ref Annexure 3
8	**Sub Total**	**3,910**	**208**	**427**	**633**	**771**	**823**	**824**	**827**	**832**	**837**	**844**	**Sum of A1 to A7**
B	**CASH OUTFLOW**												
1	Capital Project expenditure	3,200	0	0	0	0	76	191	0	0	76	0	Ref Annexure 1& 2.7
2	Other normal cap exp	457											Ref Annexure 1& 2.7
3	Increse in Working Cap:	253	37	50	3	0	0	0	0	0	0	0	Ref Annexure 1.7
5	Decrease in term loan		0	0	274	274	274	274	274	274	274	274	
7	Interest on term loans		132	132	128	111	95	78	62	45	29	12	Ref Annexure 2.8
8	Interest on work cap loan		9	9	9	9	9	9	9	9	9	9	Ref Annexure 2.8
9	Income Tax	0	0	0	0	0	0	87	90	93	97	100	Ref Annexure 3.2
10	Dividend	0	0	0	0	0	0	0	0	0	0	0	Provision
11	Sub Total	3,910	178	191	414	394	454	640	435	422	484	396	Sum of B1 to B10
	OPENING BALANCE	0	0	30	267	486	863	1,232	1,416	1,808	2,218	2,571	
C	**SURPLUS**	**0**	**30**	**236**	**219**	**377**	**370**	**184**	**392**	**410**	**353**	**448**	Difference(A9)-(B11)
D	**CLOSING BALANCE**	**0**	**30**	**267**	**486**	**863**	**1,232**	**1,416**	**1,808**	**2,218**	**2,571**	**3,019**	

ANNEXURE- 5

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

PROJECTED BALANCE SHEET

	Year of Operation		1	2	3	4	5	6	7	8	9	10	
No	**Item**	**In RO '000**											**Remarks**
A	**ASSETS EMPLOYED**												
1	Fixed Assets												
a	Gross Fixed Assets	3,200	3,200	3,200	3,200	3,200	3,276	3,467	3,467	3,467	3,542	3,542	Refer Annexure - 2.7
b	Preliminary expenses	457	0	0	0	0	0	0	0	0	0	0	Refer Annexure- 2.7
c	Acc. Depreciation	0	155	310	465	620	775	930	1,085	1,240	1,395	1,550	Refer Annexure - 2.7
d	Net Fixed Assets	3,657	3,045	2,890	2,735	2,580	2,500	2,536	2,381	2,226	2,147	1,992	
2	Current Assets												
a	Cash	0	30	267	486	863	1,232	1,416	1,808	2,218	2,571	3,019	Refer Annexure - 4
b	Other Cur. Assets	253	290	340	343	343	343	343	343	343	343	343	Refer Annexure - 1.7
c	Total Cur. Assets	253	320	607	829	1,206	1,575	1,759	2,151	2,561	2,914	3,362	
3	Less: Cur. Liabilities	0	0	0	0	0	0	0	0	0	0	0	
		3,910	**3,365**	**3,497**	**3,564**	**3,785**	**4,076**	**4,295**	**4,533**	**4,788**	**5,061**	**5,354**	
B	**FINANCED BY**												
1	Equity	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	1,564	Refer Annexure - 1
2	Term Loan from Bank	2,194	2,194	2,194	1,920	1,646	1,371	1,097	823	549	274	0	
3	Statutory reserve		0	13	47	97	153	203	254	307	362	418	
4	General reserves	0	-545	-426	-119	327	835	1,280	1,740	2,216	2,709	3,220	Cu.NP-Cu.Dividend
5	Bank Borrowings	152	152	152	152	152	152	152	152	152	152	152	Refer Annexure - 2.8
		3,910	**3,365**	**3,497**	**3,564**	**3,785**	**4,076**	**4,295**	**4,533**	**4,788**	**5,061**	**5,354**	

ANNEXURE-6													
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)													
INTERNAL RATE OF RETURN ON TOTAL CAPITAL													
	Year of Operation		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
No	**Item**	**In RO '000**											**Remarks**
A	**CASH INFLOW**												
1	Net Profit bef. Tax		-545	131	341	496	564	581	602	623	644	667	Refer Annexure - 3
2	Depreciation		155	155	155	155	155	155	155	155	155	155	Ref Annexure 2.7
3	Prelim Exp written off		457	0	0	0	0	0	0	0	0	0	Ref Annexure 2.7
4	Finance Cost		141	141	137	120	104	87	71	54	38	21	Ref Annexure 2.8
5	Salvage Value		0	0	0	0	0	0	0	0	0	2,335	Ref Annexure 2.7
6	Sub Total		208	427	633	771	823	824	827	832	837	3,178	Sum of A1 to A5
B	**CASH OUTFLOW**												
1	Capital Project expenditure	3,200	0	0	0	0	76	191	0	0	76	0	Refer Annexure - 1
2	Other normal cap exp	457	0	0	0	0	0	0	0	0	0	0	Refer Annexure - 1
3	Working Capital	253	37	50	3	0	0	0	0	0	0	0	Refer Annexure - 1
4	Income Tax		0	0	0	0	0	87	90	93	97	100	Refer Annexure - 3.2
5	Sub Total	3,910	37	50	3	0	76	278	90	93	172	100	Sum of B1 to B4
C	**NET CASHFLOW (AT)**	-3,910	**171**	**377**	**630**	**771**	**748**	**545**	**737**	**739**	**665**	**3,078**	
E	**INTERNAL RATE OF RETURN ON TOTAL INVESTMENT**										**12.2%**		

ANNEXURE- 7													
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)													
INTERNAL RATE OF RETURN ON EQUITY CAPITAL (AFTER TAX)													
	Year of Operation	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
No	**Item**	**In RO '000**											**Remarks**
A	**CASH INFLOW**												
1	Net Profit before Tax		-545	131	341	496	564	581	602	623	644	667	Refer Annexure- 3
2	Depreciation		155	155	155	155	155	155	155	155	155	155	Refer Annexure - 2.7
3	Prelim Exp written off	0	457	0	0	0	0	0	0	0	0	0	Refer Annexure - 2.7
5	Salvage Value	0	0	0	0	0	0	0	0	0	0	2,335	Refer Annexure - 2.7
6	Sub Total	0	67	286	496	651	720	736	757	778	799	3,157	Sum of A1 to A4
B	**CASH OUTFLOW**												
1	Equity	1,564	0	0	0	0	0	0	0	0	0	0	Refer Annexure - 1
2	Fixed Assets	0	0	0	0	0	76	191	0	0	76	0	Refer Annexure - 1
3	Working Capital	253	37	50	3	0	0	0	0	0	0	0	Refer Annexure - 1
4	Loan Instalment	0	0	0	274	274	274	274	274	274	274	274	Refer Annexure - 2.8
5	Income Tax	0	0	0	0	0	0	87	90	93	97	100	Refer Annexure - 3.1
6	Sub Total	1,817	37	50	277	274	350	553	364	368	447	374	Sum of B1 to B5
C	**NET CASHFLOW**	**-1,817**	**30**	**236**	**219**	**377**	**370**	**184**	**392**	**410**	**353**	**2,783**	
D	**INTERNAL RATE OF RETURN ON EQUITY INVESTMENT**								**15.7%**				

ANNEXURE- 8

FOOD TECHNOLOGY TRAINING TESTING AND DEVELOPMENT CENTRE

SENSITIVITY ANALYSIS (IRR FOR 10 YEARS)

		Projection	Change in One				
S.No.	**Item**	**No Change**	**Variable at a Time**			**Combined**	
A	**VARIABLE**		**Trainee**	**Reduction**	**Sales**		
			Nos	**in income**	**Value**	**Fee**	
B	**PESSIMISTIC**						
	Change		**-10%**	**10%**	**-10%**	**-10%**	
C	**I R R - PESSIMISTIC PROJECTION**						
1	**I R R on Investment**	13.0	11.4	8.4	10.1	11.3	
2	**I R R on Equity**	15.7	12.9	7.5	10.5	12.6	

ANNEXURE- 9

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

BREAK EVEN ANALYSIS

S.No.	Item	Year 1	Year 2	Year 3	Year 4	Remarks
		In RO				
A	**FIXED COST**					
1	Faculty Cost	365	427	490	499	Refer Annexure - 2
2	Overhads	20	20	20	20	Refer Annexure - 2
3	Admin. Expenses	206	211	263	269	Refer Annexure - 2
4	Marketing Expenses	25	25	29	26	Refer Annexure - 2
5	Depreciation	155	155	155	155	Refer Annexure - 2
6	Prelim. Expenses written off	457	0	0	0	Refer Annexure - 2
7	Financing Cost	141	141	137	120	Refer Annexure - 2
8	Income Tax	0	0	0	0	Refer Annexure - 2
9	Sub Total	1369	980	1093	1090	
B	**VARIABLE COST**					
1	Consumable & Franchise cost	119	156	197	211	Refer Annexure - 2
2	Utilities	39	52	65	57	Refer Annexure - 2
3	Misc. Expenses	0	1	2	3	
4	Sub Total	158	209	264	271	
C	**SALES**	1041	1396	1791	1954	Refer Annexure - 3
D	**CONTRIBUTION**	883	1187	1527	1683	Difference C - B
E	**BREAK EVEN POINT**	155.1	82.6	71.6	64.8	As % of Revenue
		1614	1152	1282	1266	As revenue in RO
F	**CASH BEP**	85.7	69.5	61.4	55.6	As % of Revenue
		892	970	1100	1086	As revenue in RO

ANNEXURE- 10

FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)

RATIO ANALYSIS

	Years of Operation	1	2	3	4	5	6	7	8	9	10	
A	**COST RATIOS**											
1	Consumable / Total Income	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	
	Franchise Cost/ Income	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
2	Utilities / Total Income	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	
3	Salary of Faculty / Total Income	35%	31%	27%	26%	25%	25%	25%	26%	26%	26%	
4	Prime Cost / Total Income	50%	46%	42%	39%	39%	39%	39%	40%	40%	40%	
5	Overheads / Total Income	8%	7%	6%	6%	6%	6%	7%	7%	7%	7%	
6	Cost / Total Income	58%	52%	48%	45%	45%	45%	46%	46%	47%	47%	
7	Administrative exp. / Total Inco	20%	15%	15%	14%	13%	14%	14%	14%	14%	14%	
8	Marketing exp. / Total Income	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	
9	Finance Cost / Total Income	14%	10%	8%	6%	5%	4%	3%	3%	2%	1%	
10	Non-Cash exp. /Total Income	59%	11%	9%	8%	8%	7%	7%	7%	7%	7%	
11	Total Cost / Income	152%	91%	81%	75%	72%	72%	72%	71%	71%	70%	
B	**PROFITABILITY RATIOS**											
1	PBDIT / Income	20%	31%	35%	39%	40%	40%	39%	39%	38%	38%	
2	Operating profit / Income	-8%	9%	19%	25%	28%	28%	28%	29%	29%	30%	
3	PAT / Income	-52%	9%	19%	25%	28%	24%	24%	25%	25%	25%	
4	PAT / Investment	-14%	3%	9%	13%	15%	13%	14%	14%	15%	15%	
5	Payout Ratio	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
6	EPS	-348	76	196	285	325	284	294	305	315	326	

ANNEXURE- 11												
FOOD TECHNOLOGY TRAINING TESTING & DEVELOPMENT CENTRE (FTTTDC)												
DEBT SERVICE COVERAGE RATIO												
	Years of Operation	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No	**Item**	**In RO '000**										
1	Profit after tax		-545	131	341	496	564	494	511	529	548	567
2	Depreciation		155	155	155	155	155	155	155	155	155	155
3	Prelimnery exp. Written off		457	0	0	0	0	0	0	0	0	0
4	Interest		141	141	137	120	104	87	71	54	38	21
5	Total		208	427	633	771	823	736	737	739	741	743
1	Annual repayment		0	0	274	274	274	274	274	274	274	274
2	Interest		141	141	137	120	104	87	71	54	38	21
3	Total		141	141	411	394	378	362	345	329	312	296
	D.S.C.R		1.48	3.03	1.54	1.96	2.18	2.04	2.14	2.25	2.37	2.51
	WT. AVERAGE D.S.C.R	**2.11**										