

ESTIMATION OF DEMAND OF DAIRY PROFESSIONAL FOR THE PERIOD COVERING YEARS 2017 TO 2021

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ABSTRACT

Survey Method has been used for estimating the demand of dairy professionals for the given period i.e. the year 2017 to 2021. The study included a Survey of employers of dairy professionals by using a questionnaire. The survey questionnaire sought information about the number of dairy professionals the respondent dairy plants would be hiring during the period year 2017 to 2021. The respondent dairy plants took into account their future business plans and then gave responses regarding the number of dairy professionals they would be requiring in the future period. In the year 2017-18 there is estimated a shortage of 143 dairy professionals. However, from next year onwards i.e 2018-19 to 2020-21, there will be an excess supply of dairy graduates. Also, it can be seen that at the end of 5 year period there will be a surplus of 350 dairy graduates. In the next five years, the excess supply of Postgraduate in Dairy will get reduced as the demand of Post Graduates is expected to increase. Also, it can be seen that at the end of 5 year period, there will be a surplus of 270 dairy Post graduates- At the end of 5 year period, there will be a shortage of 10 dairy PhDs. However, there is a word of caution here, as the demand for dairy PhDs has been assumed solely from the Dairy Science Colleges. The actual shortage may result only if the dairy science colleges initiate the process of filling vacant positions. At the end of 5 year period, there will be a surplus of around 1451 Dairy professionals in the country. The total supply of dairy science colleges in India has increased considerably because a large number of colleges have been established in the last decade or so.

KEYWORDS: Demand for Dairy Professional, Dairy Graduates, Dairy Technologists, Dairy Manpower, Scope for Dairy Professionals

INTRODUCTION

Survey Method has been used for estimating the demand of dairy professionals for the given period i.e. the year 2017 to 2021. The study included a Survey of employers of dairy professionals by using a questionnaire. The survey questionnaire sought information about the number of dairy professionals the respondent dairy plants would be hiring during the period year 2017 to 2021. The respondent dairy plants took into account their future business plans and then gave responses regarding the number of dairy professionals they would be requiring in the future period.

The present study has received a high response (in the survey) from the cooperative dairy sector in India. Also, the major employer of dairy professionals in the country is the “cooperative dairy sector”. However, the other employers including private dairy sector, educational institutes, ancillary industries, the government organization which

also play an important role in the employment of dairy professionals, have given a low response in the survey. Hence, in the first step, the 'Dairy Professionals demand of cooperative dairies' has been estimated, and then by taking that demand as a base (starting point) the demand for other employers (private dairy sector, ancillary industry, etc.) has been estimated subsequently. Finally, total demand has been estimated by summing up the estimated demands from all the employer categories.

Important Points Considered in Demand Estimation of Dairy Professionals

The estimation of demand for dairy professionals for the period 2017 to 2021 was done as follows

- The main employers of dairy professionals in the country were considered as – (a) Cooperative dairy plants (including State Federations), (b) Dairy Science Colleges in India (total 20 colleges), (c) Private Dairies and (d) Miscellaneous (government department, self-employment, abroad settlement etc.).
- Wherever necessary most practical and conservative assumptions were made in missing data so as to facilitate the determination of nearly true demand or supply.
- The dairy plants of NDDDB under "Producer Company" has been considered as Private dairy plants.

Estimation of Future Demand of Dairy Professionals for Cooperative Dairy Sector

In total 207 responses received from cooperative dairy plants in the country. The following demand estimation table was prepared by aggregating the responses given by respondent dairy plants.

Table 1: Estimated Manpower Details of the Selected 207 Cooperative Dairy Plants (LLPD: Lakh Litres per Day)

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
A	Installed Plant capacity (in LLPD) within State	507.27	595.89	645.5	670.85	690.85	622.1	8.0%
A1	Installed Plant capacity (in LLPD) Outside State	83	87.5	95.75	98.25	98.75	92.7	4.4%
A2	Total installed capacity (in LLPD)	590.27	683.39	741.25	769.1	789.6	714.7	7.5%
B*	No. of Dairy professionals in the organization at the beginning of the year	2049	2249	2514	2680	2777	2453.8	7.9%
C	ADD :Estimated new recruitment during the year with following qualifications							
	1. Graduates	229	293	199	163	171	211.0	-7.0%
	2. Post graduates	23	27	31	17	42	28.0	16.2%
	3. Ph.D	0	0	0	0	0	0.0	0.0%
	Total C = (1+2+3)	252	320	230	180	213	239.0	-4.1%
D	a) Estimated number of dairy professionals leaving the organization due to retirement	39	43	53	73	64	54.4	13.2%
	b) Estimated number of dairy professionals leaving the organization due to other reasons	13	12	11	10	11	11.4	-4.1%
	Total D = (a+b)	52	55	64	83	75	65.8	9.6%
E	No. of Dairy professionals at the END of the year =(B+C -D)	2249	2514	2680	2777	2915	2627.0	6.7%
F	Estimated Non- Dairy manpower in the organization	28663	29273	29230	29609	30370	29429	1.5%
G	Estimated total manpower in the organization (E + F)	30912	31787	31910	32386	33285	32056	1.9%
H	No. of Dairy Professionals / LLPD of Installed capacity (E/A2)	3.81	3.68	3.62	3.61	3.69	3.7	-0.8%

From the above, it can be seen that there will be around 3.7 (approximately 4) dairy professionals per Lakh Litre of Installed capacity. Also, the installed capacity of the respondent dairy plants is expected to increase at a growth rate of around 7.5%.

The Estimated Demand of Dairy Professionals in the Selected 207 Cooperative Dairy Plants

The data of estimated demand of dairy professionals has been consolidated and presented in the below table.

Table 2: Estimated Demand of Dairy Professionals in the Selected 207 Cooperative Dairy Plants

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	229	293	199	163	171	211.0	-7.0%
2	Post graduates	23	27	31	17	42	28.0	16.2%
3	Ph.D	0	0	0	0	0	0.0	0.0%
	Total = (1+2+3)	252	320	230	180	213	239.0	-4.1%

Further the 207 selected cooperative dairy plants belong to 21 states and the total milk production in these 21 states constitute around 94 % of India's Milk Production. However, states/ Union Territories not covered under data collection for dairy plants were - West Bengal, Chandigarh, Lakshadweep, Daman And Diu, Dadra & Nagar Haveli, Assam, Manipur, Mizoram, Nagaland, Sikkim, Tripura, Arunachal Pradesh, Meghalaya, Jammu Kashmir. The milk production of these states in 2015-16 was around 8.756 Million tonnes which is around 6% of India's total milk production 155.5 Million Tonnes

Hence the above mentioned demand in table 2 is increased by 10% to estimate the entire country's demand of dairy professionals. The total dairy professional demand (after taking into consideration the points mentioned in the above paragraph) is estimated and shown below

Table 3: Estimated Demand of Dairy Professionals in All Cooperative Dairy Plants in India

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	252	322	219	179	188	232	-7%
2	Post graduates	25	30	34	19	46	31	16%
3	Ph.D	0	0	0	0	0	0	NA
	Total = (1+2+3)	277	352	253	198	234	263	-4%

From the above, table it can be seen that on an average 232 dairy graduates, 31 dairy postgraduates and 'nil' PhDs would be required per year by dairy cooperatives in India.

The Estimated Demand for Dairy professionals from Dairy Science Colleges

The demand of dairy professionals has been provided by most of the Dairy Science colleges in India except five colleges. For these five colleges which have not given response to the project, realistic & conservative data have been assumed.

Table 4: Estimated Demand of Dairy Professionals as Provided By Dairy Science Colleges in India

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21
A	Expected Number of faculty members retiring in the coming years	5	11	11	4	7
B	Expected Number of faculty members Leaving the college for other reasons	3	5	3	3	3
C	Total (A+B)	8	16	14	7	10
D	Expected number of new faculty members (with basic degree in Dairy technology) to be appointed during the academic year in the following departments					
i	Dairy Technology Department	20	16	16	7	8
ii	Dairy Chemistry Department	8	9	14	7	6
iii	Dairy Microbiology Department	11	10	14	7	5
iv	Dairy Engineering Department	8	8	12	7	7
v	Dairy Business Management Department	8	7	6	2	7
vi	Other department (please specify)	1	0	0	2	1
	TOTAL	56	50	62	32	34
E	SRA (or any other Designation) with Dairy Science qualification	0	0	0	0	0

Total Estimated Demand of Dairy professionals from Dairy Science Colleges has been assumed to 50% as Post-graduates and 50% as Ph.D.'s holders and hence the following table is prepared accordingly.

Table 5: Estimated Demand of Dairy Professionals from Dairy Science Colleges in India

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	0	0	0	0	0	0	NA
2	Post graduates	28	25	44	16	17	26	-12%
3	Ph.D	28	25	18	16	17	21	-12%
4	Total = (1+2+3)	56	50	62	32	34	47	-12%

From the above, table it can be seen that on an average 26 Postgraduates and 21 Ph.D. would be required per year by Dairy Science Colleges in India.

Demand from Private Dairy Sector

According to the latest edition of the industry publication, **Dairy India** (Edition Seven) – “Private corporate dairies will overtake cooperatives and handle larger milk volumes than the latter within the next five years. In 2015, cooperatives and organized private dairies procured an estimated 15.55 million tonnes each of milk. By 2020, procurement by private dairies is projected to reach 28.93 million tonnes, ahead of the 23.67 million tonnes of cooperatives. As far as cooperatives go, a major chunk of their total average milk procurement of around 415 LLPD in 2015-16 was accounted for by only 5 state-level federations: Gujarat (‘Amul’ at 170 LLPD), Karnataka (‘Nandini’ at 63 LLPD), Tamil Nadu (‘Aavin’ at 30 LLPD), Rajasthan (‘Saras’ at 25 LLPD) and Bihar (‘Sudha’ at 17 LLPD). The cooperative sector now basically comprises a few large players that are mainly into liquid milk marketing. The Chennai-based Hatsun Agro Product Ltd alone procures an average 26 lakh litres per day (LLPD) or close to 1 MT annually. Besides, there are at least 9 companies with an average milk procurement of 10-15 LLPD each (Parag Milk Foods, Schreiber Dynamix Dairies, Heritage Foods, Tirumala Milk Products, quality Ltd, Sterling Agro Industries, VRS Foods, Bhole Baba Milk Food Industries and Nestle India) and many others that do 5-10 LLPD (Prabhat Dairy, Indapur Dairy, Dodla Dairy, Creamline Dairy Products, SMC Foods, Milkfood, Gopaljee Dairy Foods, and Anik Industries). Organized dairies, both cooperatives and private, together handled 31.1 MT or just over 21 percent of India’s total milk production of 146.3 MT in 2015. But in 2020, the country’s output, Dairy India estimates, will touch 190 MT and the organized sector would procure 52.6 MT or nearly 28 percent of this. The remaining 72 percent will be handled by traditional small-scale suppliers/vendors (58 MT, marginally up from 54.6 MT in 2015) or retained for consumption within

rural households (79.4 MT, up from 60.6 MT)”.

- However, it has been observed that the Private dairy players usually employ less number of dairy professionals for the same capacity as compared to cooperative dairies. Also, majority of private dairy players have very small capacity, for e.g. 20,000 lpd, 50,000 lpd etc. Hence, even though the private dairy plants will handle more milk than cooperative dairies, their relative demand of dairy professional can be assumed to be lower than that of cooperatives. (Note: lpd is ‘Litres per day’)
- Hence, it is assumed that demand of dairy professionals from private dairy during a particular year will be around 70% of demand of cooperative dairies during that year.

Accordingly, the demand for private dairies has been calculated below (i.e as 70% of cooperative demand)

Table 6: Estimated Demand of Dairy Professionals from Private Dairies (i.e 70% of cooperative demand)

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	176	226	153	126	132	162	-7%
2	Post graduates	18	21	24	13	32	22	16%
3	Ph.D	0	0	0	0	0	0	NA
4	Total = (1+2+3)	194	246	177	139	164	184	-4%

From the above table, it can be seen that on an average around 162 Dairy Graduates and 22 Dairy Post Graduates and ‘Nil’ PhDs would be required per year by the Private dairy plants in India.

Combined Demand of Dairy Professionals from Cooperative Dairy Plants, Private Dairy Plants, and Dairy Science Colleges

The below-mentioned table has been prepared by summing up tables 3, table 5 and table 6. Hence the estimated combined demand of dairy professionals from Cooperative dairy plants, Private dairy plants, and Dairy science colleges has been given below.

Table 7: Estimated Demand of Dairy Professionals from Cooperative Dairies, Private Dairies and Colleges

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	428	548	372	305	320	395	-7%
2	Post graduates	71	75	102	48	96	78	8%
3	Ph.D	28	25	18	16	17	21	-12%
	Total = (1+2+3)	527	648	492	369	432	494	-5%

Estimated demand of Dairy Professionals due to Miscellaneous Job Opportunities

The Dairy Science Colleges have provided data about activity undertaken by a dairy professional after completing graduation. The information is presented in the table below

Table 8: Trend of Activities/Jobs Undertaken By Dairy Professionals after Completing Graduation

Students From a Given Batch of B.Tech (D.T)	Year 2011-12	Year 2012-13	Year 2013-14	Year 2014-15	Year 2015-16	AVG	Growth Rate
Who join ancillary industries, banks, etc	7%	4%	3%	4%	5%	5%	-11%
Who join dairy plants outside state	18%	21%	21%	18%	16%	19%	-3%
Who join dairy plants within state	39%	47%	48%	52%	54%	48%	8%
Who join higher studies	29%	21%	23%	21%	22%	23%	-7%
Who Start own dairy business	0%	1%	0%	1%	1%	0%	NA
Who take job outside the country	6%	7%	5%	4%	3%	5%	-18%
Total	100%	100%	100%	100%	100%	100%	0%

As it can be seen from the table no. 8 above under column 'Year 2015-16', that demand from ancillary industries & banks (5%), Starting own dairy business (1%) & job outside the country(3%) is on an average 9% (i.e 5% + 1% + 3%) of the total demand. Further, there is also an anticipated demand of dairy professionals due to the implementation of FSSAI, implementation of NDP phase I and II, increase in the percentage of organized sector and increase in export opportunities.

Hence, the demand of Dairy Professionals due to such miscellaneous job opportunities (Ancillary industries, banks, Own business, a job abroad, an effect of NDP plan, strict implementation of FSSA) is assumed to be 25% of cooperative demand. Following table has been prepared.

Table 9: Estimated Demand of Dairy Professionals Due To Miscellaneous Job Opportunities

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	107	137	93	76	80	99	-7%
2	Post graduates	18	19	25	12	24	20	8%
3	Ph.D	7	6	5	4	4	5	NA
	Total = (1+2+3)	132	162	123	92	108	123	-5%

Total Estimated Demand of Dairy Professionals During 2017 To 2021

The total demand of dairy professionals for the period has been determined by consolidating the demands given in table no. 7 (cooperative. private and colleges) and table no. 5.9 (miscellaneous)

Table 10: Total Estimated Demand of Dairy Professionals During 2017 To 2021

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	AVG	Growth Rate
1	Graduates	535	685	465	381	400	493	-7%
2	Post graduates	89	94	127	60	119	98	8%
3	Ph.D	35	31	23	20	21	26	-12%
4	Total = (1+2+3)	659	811	615	461	540	617	-5%

Matching Demand with Supply of Dairy Professionals

The total number of dairy professionals passing out from in a given year has been taken from section 3.3 from chapter 3. The same table is reproduced below

Table 11: Total Dairy Professionals Supply in 2016 To 2021 from Dairy Science Colleges

Dairy Qualification	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Growth Rate P.A
Graduates	693	705	754	754	754	2.13%
Post Graduates	152	152	152	152	152	0.00%
Ph.D.	25	21	21	25	25	0.00%
Total	870	878	927	931	931	1.71%

Out of the above mentioned passing out graduates around 23% will join higher studies. Therefore the supply of graduates is reduced by that much quantity as shown in the table below

Table 12: Total Dairy Professionals Passing Out in 2016 To 2021 From Dairy Science Colleges after Deducting those Who Join Higher Studies

Dairy Qualification	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Remark
Graduates	534	543	581	581	581	Graduates Supply reduced by 23% for Higher studies
Post Graduates	152	152	152	152	152	
Ph.D.	25	21	21	25	25	
Total	711	716	754	758	758	

Demand Supply Scenario in Dairy Graduates For the Period 2016-17 to 2020-21

The estimated demand and supply of Dairy Graduates in the country is given in the table below.

Table 13: Matching Demand and Supply of Dairy Graduates

Sr. No.	Education	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Total
1	Graduates demand	535	685	465	381	400	2466
2	Graduates Supply	534	542	580	580	580	2816
3	<i>Excess Supply (2-1)</i>	<i>-1</i>	<i>-143</i>	<i>115</i>	<i>199</i>	<i>180</i>	350

It can be seen from the table that in the year 2017-18 there is estimated a shortage of 143 dairy professionals. However, from next year onwards i.e 2018-19 to 2020-21, there will be an excess supply of dairy graduates. Also, it can be seen that at the end of 5 year period there will be a surplus of 350dairy graduates.

Demand Supply Scenario of Post Graduates in Dairy for the Period 2016-17 to 2020-21

The estimated demand and supply of Dairy Post Graduates in the country is given in the table below.

Table 14: Matching Demand and Supply of Dairy Post Graduates

Sr. No.	Education	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Total
1	Post Graduates demand	89	94	127	60	119	490
2	Post Graduates supply	152	152	152	152	152	760
3	<i>Excess supply (5-4)</i>	<i>63</i>	<i>58</i>	<i>25</i>	<i>92</i>	<i>33</i>	270

From the above table, it can be seen that in the next five years, the excess supply of Postgraduate in Dairy will get reduced as the demand for PostGraduates is expected to increase. Also, it can be seen that at the end of 5 year period there will be a surplus of 270 dairy Post graduates.

Demand supply scenario of Ph.D. in Dairy for the period 2016-17 to 2020-21

The estimated demand and supply of PhD in Dairy in the country is given in the table below

Table 15: Matching demand and Supply of Dairy PhDs

Sr. No.	Education	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Total
1	Ph.D. demand	35	31	23	20	21	35
2	Ph.D. supply	25	21	21	25	25	25
3	<i>Excess supply (8-7)</i>	<i>-10</i>	<i>-10</i>	<i>-2</i>	<i>5</i>	<i>4</i>	<i>-10</i>

From the above table, it can be seen that at the end of 5 year period there will be a shortage of 10 dairy PhDs. However, there is a word of caution here, as the demand for dairy PhDs has been assumed solely from the Dairy Science Colleges. The actual shortage may result only if the dairy science colleges initiate the process of filling vacant positions.

Demand Supply Scenario of Dairy Professionals for the period 2016-17 to 2020-21

The estimated demand and supply of PhD in Dairy in the country is given in the table below

Table 16: Matching Demand and Supply of Dairy Professionals

Sr. No.	Particulars	Year 2016-17	Year 2017-18	Year 2018-19	Year 2019-20	Year 2020-21	Total
1	Total demand of Dairy Professionals	659	811	615	461	540	3086
2	Total supply of Dairy Professionals	870	878	927	931	931	4537
3	<i>Excess supply (11-10)</i>	<i>211</i>	<i>68</i>	<i>312</i>	<i>470</i>	<i>391</i>	1451

From the above table, it can be seen that at the end of 5 year period there will be a surplus of around 1451 Dairy professionals in the country. The total supply of dairy science colleges in India has increased considerably because a large number of colleges have been established in the last decade or so.

SUMMARY AND CONCLUSIONS

- In the year 2017-18 there is estimated a shortage of 143 dairy professionals. However, from next year onwards i.e 2018-19 to 2020-21, there will be an excess supply of dairy graduates. Also, it can be seen that at the end of 5 year period, there will be a surplus of 350 dairy graduates.
- In the next five years, the excess supply of Postgraduate in Dairy will get reduced as the demand of Post - Graduates is expected to increase. Also, it can be seen that at the end of 5 year period, there will be a surplus of 270 dairy Postgraduates-
- At the end of 5 year period, there will be a shortage of 10 dairy PhDs. However, there is a word of caution here, as the demand for dairy PhDs has been assumed solely from the Dairy Science Colleges. The actual shortage may result only if the dairy science colleges initiate the process of filling vacant positions.
- At the end of 5 year period, there will be the surplus of around 1451 Dairy professionals in the country.
- The total supply of dairy science colleges in India has increased considerably because a large number of colleges have been established in the last decade or so.

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