

SKILLS AND QUALITY OF EDUCATION IMPARTED BY DAIRY SCIENCE COLLEGES IN INDIA

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ABSTRACT

Until a decade ago, there were only a few Dairy Science Colleges imparting dairy education in India. SMC College of Dairy Science, Anand was one of them. During the last ten years, many dairy science colleges have been established, and out of these, three more dairy science colleges are established in the state of Gujarat alone. Still, some more colleges are expected to come up in the near future. This trend is similar to the one experienced by other degree colleges in India viz. Engineering, Pharmacy, Management, Medical etc.

There is 20 dairy science colleges in India out of which 10 offer post-graduation courses and 7 offer Ph.D. courses. At Graduate level the Dairy Science College gives more emphasis on- '1 year Experiential Learning (hands -on training) in dairy plant', 'In-house student training dairy' and 'Industrial visits' followed by 'Compulsory Educational tour' & 'Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills'. At M.Tech level dairy science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills, etc. and Encourage Extracurricular & Cultural activities followed by In-house student training dairy, Encourage Sports and that followed by Industrial visits and 'invited / guest lectures'. At Doctorate level Dairy Science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills, etc. and Encourage Extracurricular & Cultural activities, Encourage Sports, followed by In-house student training dairy, 'invited / guest lectures'. Further, there is a shortage of teaching faculty in Dairy science colleges can seriously affect the quality of dairy science education provided in India.

KEYWORDS: Graduate, Post Graduate and Doctorate in Dairy Science College, Dairy Professionals, Dairy Education

INTRODUCTION

Until a decade ago, there were only a few Dairy Science Colleges imparting dairy education in India. SMC College of Dairy Science, Anand was one of them. During the last ten years, many dairy science colleges have been established, and out of these, three more dairy science colleges are established in the state of Gujarat alone. Still, some more colleges are expected to come up in the near future. This trend is similar to the one experienced by other degree colleges in India viz. Engineering, Pharmacy, Management, Medical etc.

With respect to the increasing number of dairy science colleges in India, one can easily agree that it is a Quantitative expansion. The **quantitative expansion** brings along with it its own disadvantages. The first and foremost is the "over-production". It means more number of graduates being produced. Overproduction leads to –

- **Educated Unemployed:** A number of educated unemployed created by college results in wastage of resources of the candidate as well as the education system. It is finally a lose-lose situation for all.
- **Lowering of Salaries:** As more candidates are available for a given job, the employer tends to exploit the situation by offering lower salaries to each candidate. This is very demotivating to the brightest students.
- **Shifting Abroad:** With the lack of opportunities in the domestic country, it is possible that candidates/graduates may start moving to foreign countries in search of a decent job. Candidates may use the little savings of their parents in their attempt to shift to abroad and many times it is not sure whether they actually result in bright careers. Anyway, it also leads to the brain drain of skilled manpower of the country.
- **Shifting to other Disciplines:** It is also a side effect of over-production of graduates in one field which cannot be absorbed in the same field.
- **Ultimate Devaluation of Degree:** This may arise in the event when due to overproduction, overqualified candidates start offering themselves for posts requiring only the basic degrees, e.g. Ph.D. and M. Tech qualified candidates applying for a job which is requiring only a fresh graduate.

With the above-mentioned background, the present study seeks to identify the skills/ quality aspects which dairy science colleges emphasize and try to deliver to the Dairy professionals while providing dairy education.

As pointed out earlier, there is 20 dairy science colleges in India out of which 10 give post-graduate courses and 7 give Ph.D. courses.

Table 1

Region	Total Number of Dairy Science Colleges	No. of Colleges Offering Graduation	No. of Colleges Offering Post-Graduation	No. of Colleges Offering Ph.D
East	2	2	2	2
West	7	7	3	2
North	4	4	3	2
South	7	7	2	1
Total	20	20	10	7

Skill Imparted by the Dairy Science Colleges

In order to know the skill/quality aspect emphasized by dairy science colleges in India, a questionnaire was prepared for dairy science colleges as respondent. The questionnaire sought all necessary information from the respondents. Out of total 20 Dairy Science colleges in India, 17 dairy colleges gave responses by filling the Questionnaire. The main findings are presented below.

Skill/ Education emphasis at the Graduate Level

Table 2

Sr. No	Skill/ Education Imparted by your Organization	Ranking
1	1 year Experiential Learning (hands -on training) in dairy plant	1
2	In-house student training dairy	2
3	Industrial visits (1 or 2 days) – during semesters.	2
4	Classes for professional development - including Motivation, attitude, teamwork, problem solving skills, etc.	3
5	Compulsory Educational tour (>15 days)	3

From the above table it can be seen that at Graduate level the dairy Science College gives more emphasis on- ‘1 year Experiential Learning (hands -on training) in dairy plant’, ‘In-house student training dairy’ and ‘Industrial visits’ followed by ‘Compulsory Educational tour’ & ‘Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills’.

Skill/ Education Emphasis at M. Tech. Level

Table 3

Sr. No	Skill/ Education Imparted by your Organization	Ranking
1	Classes for professional development - including Motivation, attitude, teamwork, problem solving skills, etc.	1
2	Encourage Extracurricular & Cultural activities	1
3	In-house student training dairy	2
4	Encourage Sports	2
5	Industrial visits (1 or 2 days) – during semesters.	3
6	Arranging Series of invited / guest lectures	3

From the above table it can be seen that at M.Tech level dairy science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills, etc. and Encourage Extra curricular & Cultural activities followed by In-house student training dairy , Encourage Sports and that followed by Industrial visits and ‘invited / guest lectures’.

Skill/ Education Emphasis at Doctorate Level

Table 4

Sr. No	Skill/ Education Imparted by your Organization	Ranking
1	Classes for professional development - including Motivation, attitude, teamwork, problem solving skills, etc.	1
2	Encourage Extracurricular & Cultural activities	1
3	Encourage Sports	1
4	In-house student training dairy	2
5	Arranging Series of invited / guest lectures	2
	Industrial visits (1 or 2 days) – during semesters.	3

From the above table it can be seen that at Doctorate level Dairy Science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem-solving skills, etc. and Encourage Extracurricular & Cultural activities, Encourage Sports, followed by In-house student training dairy , ‘invited / guest lectures’.

Other Factors Implicating the Quality of Dairy Science Education

The quality of dairy science education imparted by colleges is dependent upon many factors, including the Teaching faculty strength, Infrastructure available and so on. The present study has not focused on the infrastructure development in each college; rather it has focused on the basic factor of ‘number of teaching faculty’ in a college. The following tables indicate the specialization wise number of teaching faculty present in the given 19 dairy science colleges (excluding College of Dairy Technology, Warud, since faculty data was not available on its website also) of India. For the colleges which did not give responses by submitting the filled questionnaire, their responses have been included by considering the best possible conservative assumptions.

Strength of Teaching Faculty in Dairy Science Colleges

The details of the number of teaching faculty existing in the given 19 dairy science colleges have been given in the table below. The table gives the positions wise details of the faculty strength, i.e. Professor and its equivalent, Associate Professor and its equivalent and Assistant professors and its equivalent.

Strength of Teaching Faculty in the Respondent Dairy Science Colleges

Table 5

Sr.No.	Department	Professor & its Equiv.	Associate Professor & its Equiv.	Assistant Professor & its Equiv.	Total	Percentage
1	Dairy Technology	25	7	59	91	32.9%
2	Dairy Chemistry	10	7	29	46	16.6%
3	Dairy Microbiology	18	2	27	47	17.0%
4	Dairy Engineering	12	4	33	49	17.7%
5	Dairy Business Management /Dairy Economics & Dairy Extension	16	2	26	44	15.9%
	Total	81	22	174	277	100%

It can be seen from the above mentioned table that dairy technology department has the highest number of teaching faculty and other departments have more or less half of the teaching staff of Dairy Technology.

Minimum Teaching Faculty Required as per 5th Dean Committee

The fifth dean’s committee has suggested that in order to start a dairy science college, the minimum requirement for the number of faculty members in each department is as follows

Minimum Faculty Requirements for the Departments (According to 5th Dean's Committee Report)

Table 6

Sr. No.	Department	Professor	Associate Professor	Assistant Professor	Total
1	Dairy Technology	1	2	9	12
2	Dairy Chemistry	1	2	9	12
3	Dairy Microbiology	1	2	6	9
4	Dairy Engineering	1	2	6	9
5	Dairy Business Management /Dairy Economics	1	2	5	8
6	Total	5	10	35	50

The data of existing faculty members were available only for 19 colleges out of 20. (This data was obtained from the questionnaire received from colleges and also from the faculty details available on the college websites.)

Hence, the Minimum faculty requirement as per the 5th Dean Committee Report for only the 19 respondent Dairy Science Colleges has been determined below.

Minimum Faculty Requirements for the Departments (according to 5th Dean's Committee Report)

Table 7

Sr. No.	Department	Professor	Associate Professor	Assistant Professor	Total
1	Dairy Technology	19	38	171	228
2	Dairy Chemistry	19	38	171	228
3	Dairy Microbiology	19	38	114	171
4	Dairy Engineering	19	38	114	171
5	Dairy Business Management /Dairy Economics	19	38	95	152
6	Total	95	190	665	950

Existing Faculty Strength of Dairy Science Colleges (N= 19 Dairy Science Colleges)

Table 8

Sr. No.	Department	Professor	Associate Professor	Assistant Professor	Total	Percentage
1	Dairy Technology	25	7	59	91	32.9%
2	Dairy Chemistry	10	7	29	46	16.6%
3	Dairy Microbiology	18	2	27	47	17.0%
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5	Dairy Business Management /Dairy Economics	16	2	26	44	15.9%
6	Total	81	22	174	277	100%

Shortage (-)/Surplus (+) of the Faculty in Existing Dairy Science Colleges in India

Comparing the actual number of teaching faculty present in the respondent 19 colleges with the number of faculty members as per 5th Dean Committee report, the following shortage of teaching staff emerges.

Table 9

Sr. No.	Department	Professor	Associate Professor	Assistant Professor	Total
1	Dairy Technology	6	-31	-112	-137
2	Dairy Chemistry	-9	-31	-142	-182
3	Dairy Microbiology	-1	-36	-87	-124
4	Dairy Engineering	-7	-34	-81	-122
5	Dairy Business Management /Dairy Economics	-3	-36	-69	-108
6	Total	-14	-168	-491	-673

Hence we can see that in the 19 dairy science colleges which have given responses, there is a widespread shortage of teaching faculty. In total there is a shortage of 14 Professors, 168 Associate Professors, and 491 Assistant Professors. If we look at the department situation, the maximum shortage is in the dairy chemistry department shortage of 9 Professors, 31 Associate Professors, and 142 Assistant Professors. *The shortage of faculty in Dairy science colleges in India can seriously affect the quality of dairy science education provided in India.*

Top Dairy Science Colleges preferred by Dairy Cooperative Plants for Recruiting Dairy Professionals

All India Scenarios

The Main colleges from which Dairy professionals are recruited in cooperative plants of India are as given in the table below. The respondents were asked to mention the top three colleges (along with ranks 1, 2 or 3) from which they recruited dairy professionals in their organization. From the ranks obtained, the scoring method followed involved giving 3 points to rank 1 college, 2 points to rank 2 colleges and 1 point to rank 3 colleges, and finally the scores for each college were calculated. The colleges were arranged in the decreasing order of their obtained score and are presented in the below table.

Table 10

Sr. No	Top Ten Colleges at India Level	Obtained Score
1	NDRI, Karnal, Haryana	142
2	SMC College of Dairy Science, Anand	62
3	College of Technology & Agriculture Eng. Udaipur- Rajasthan	44
4	Dairy Science College, Hebbal, Bengaluru	42
5	Dairy Science College, Thrissur, Kerala	36
6	College of Dairy Science & Tech. Ludhiana, Punjab	35
7	College of Dairy Technology, Raipur- Chhattisgarh	27
8	Sanjay Gandhi Institute Of Dairy Technology, Patna	25
9	Dairy Science College, Allahabad	24
10	Dairy Science College, Tirupati	20

From the above table it can be seen that at All India level, NDRI, Karnal, SMC College of Dairy Science, Anand, College of Technology & Agriculture, Engineering, Udaipur- Rajasthan were the top 3 colleges from which dairy cooperatives carry out their recruiting.

East Region

Main colleges from which Dairy Professionals are recruited in cooperative plants of Eastern Region

Table 11

Sr. No	Name of College from which DP is Recruited in Southern Coop Dairies	Obtained Score
1	Sanjay Gandhi Institute Of Dairy Technology, Patna	17
2	NDRI, Karnal, Haryana	12
3	College of Dairy Technology, Raipur- Chhattisgarh	11
4	Jawaharlal Nehru Krishi VishwaVidhyalaya, Jabalpur, Madhyapradesh	4
5	SMC College of Dairy Science, Anand	3

From the above table it can be seen that in East Region, Sanjay Gandhi Institute of Dairy Technology, Patna, NDRI, Karnal, Haryana, College of Dairy Technology, Raipur- Chhattisgarh were the top 3 colleges from which dairy cooperatives carry out their recruiting. (N.B. The college at sr. no. 4 is not a Dairy Science College though the respondent has mentioned its name in their response)

North Region

Main colleges from which Dairy professionals are recruited in cooperative plants of the Northern Region

Table 12

Sr. No	Name of College from which DP is Recruited in Southern Coop Dairies	Obtained Score
1	NDRI, Karnal, Haryana	91
2	College of Technology & Agriculture Eng. Udaipur- Rajasthan	40
3	College of Dairy Science & Tech. Ludhiana, Punjab	34
4	Sanjay Gandhi Institute Of Dairy Technology, Patna	8
5	Dairy Science College, Allahabad	6

From the above table it can be seen that in North Region - NDRI, Karnal, Haryana, College of Technology & Agriculture, Engineering Udaipur- Rajasthan, College of Dairy Science & Tech. Ludhiana, Punjab were the top 3 colleges from which dairy cooperatives carry out their recruiting.

South Region

Main colleges from which Dairy professionals are recruited in cooperative plants of SOUTH REGION

Table 13

Sr. No	Name of College from which DP are recruited in Southern Coop Dairies	Obtained Score
1	Dairy Science College, Hebbal, Bengaluru	37
2	Dairy Science College, Thrissur, Kerala	36
3	Dairy Science College, Gulbarga	19
4	NDRI, Bengaluru	17
5	Dairy Science College, Kamareddy	16

From the above table it can be seen that in South Region – Dairy Science College, Hebbal, Bengaluru, Dairy Science College, Thrissur, Kerala and Dairy Science College, Gulbarga were the top 3 colleges from which dairy

cooperatives carry out their recruiting.

West Region

Main colleges from which Dairy professionals are recruited in cooperative plants of WEST REGION

Table 14

Sr. No	Name of College from which DP are Recruited in Southern Coop Dairies	Obtained Score
1	SMC College of Dairy Science, Anand	47
2	NDRI, Karnal, Haryana	24
3	Dairy Technology College, Pusad, Maharashtra	20
4	Dairy Science College, Udgir, Maharashtra	16
5	College of Dairy Technology, Raipur- Chhattisgarh	15

From the above table it can be seen that in West Region – SMC College of Dairy Science, Anand , NDRI, Karnal, Haryana and Dairy Technology College, Pusad, Maharashtra were the top 3 colleges from which dairy cooperatives carry out their recruiting.

Quality Related Suggestions from Dairy Science Colleges

Please provide any other information which you wish to provide with respect to dairy education in India.

Table 15

Sr. No.	Suggestions Given by Various Respondents
1	Need to strengthen faculty especially at the level of associate professor and professor. Infrastructure facilities based on cutting edge technologies needs to be installed from time to time.
2	To provide effective training for students and to prepare them for meeting the forth coming challenges, skill based hands on training to be imparted. In the light of this, each dairy science college should be equipped with full-fledged dairy farm and dairy products processing facilities. To strengthen this, in the 5th dean committee, one year STUDENT READY programme has been recommended which has been implemented in this college w.e.f. 29.08.2016
3	As per as the 5th dean committee, the admission to dairy tech. (B.Tech) should be partially routed through AIEEE (JEE) merit list, to improve the dairy education in India. The post of dairy technologist and/or dairy management should be created in KVK's.(ref, Report of ICAR fifth Dean committee, pp-272)
4	Though India is the number one milk producing country in the world, most of the milk is consumed in raw form rather than milk products partly due to the lack of inadequate milk processing facilities and trained manpower.to make trained dairy technocrats, there should be an excellent infrastructure facilities and sufficient faculty members in the entire dairy institute in India.

SUMMARY AND CONCLUSIONS

- There are 20 dairy science colleges in India out of which 10 offer post-graduate courses and 7 offer Ph.D. courses
- At Graduate level the dairy Science College gives more emphasis on- '1 year Experiential Learning (hands -on training) in dairy plant', 'In-house student training dairy' and 'Industrial visits' followed by 'Compulsory Educational tour' & 'Classes for professional development - including Motivation, attitude, teamwork, problem solving skills'.

- At M.Tech level dairy science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem solving skills, etc. and Encourage Extra curricular & Cultural activities followed by In-house student training dairy, Encourage Sports and that followed by Industrial visits and 'invited / guest lectures'.
- At Doctorate level Dairy Science College gives more emphasis on Classes for professional development - including Motivation, attitude, teamwork, problem solving skills, etc. and Encourage Extra curricular & Cultural activities, Encourage Sports, followed by In-house student training dairy, 'invited / guest lectures'.
- At all India level, NDRI, Karnal, SMC College of Dairy Science, Anand, College of Technology & Agriculture, Engineering, Udaipur- Rajasthan were the top 3 colleges from which dairy cooperatives carry out their recruitment.
- In Eastern Region, Sanjay Gandhi Institute of Dairy Technology, Patna, NDRI, Karnal, Haryana, College of Dairy Technology, Raipur- Chhattisgarh were the top 3 colleges in the country from which dairy cooperatives carry out their recruitment.
- In Northern Region - NDRI, Karnal, Haryana, College of Technology & Agriculture Engg. Udaipur- Rajasthan, College of Dairy Science & Tech. Ludhiana, Punjab were the top 3 colleges from which dairy cooperatives carry out their recruitment..
- In South Region – Dairy Science College, Hebbal, Bengaluru, Dairy Science College, Thrissur, Kerala and Dairy Science College, Gulbarga were the top 3 colleges from which dairy cooperatives carry out their recruitment..
- In West Region – SMC College of Dairy Science, Anand, NDRI, Karnal, Haryana and Dairy Technology College, Pusad, Maharashtra were the top 3 colleges from which dairy cooperatives carry out their recruitment.
- Considering the Fifth Dean Committee Report's recommendation, in the 19 dairy science colleges which have given responses, there is a widespread shortage of teaching faculty. In total there is a **shortage** of 14 Professors, 168 Associate Professors, and 491 assistant professors. If we look at the department situation, the maximum shortage is in the dairy chemistry department, which has a shortage of 9 Professors, 31 Associate Professors, and 142 assistant professors. *The shortage of faculty in Dairy science colleges can seriously affect the quality of dairy science education provided in India.*

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