

**A Proposal for Dairy Technology Lab**

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**I. Objectives of the Virtual Lab**

- To provide knowledge about the quality of milk and milk products.
- To depict the detection of adulterants in milk and milk products.
- To provide knowledge regarding the quality of dairy products

**II. List of experiments**

1. Platform Tests of milk [ COB, MBR Test, Alcohol Test, Sediment Test]
2. Determination of Fat content in Milk and Milk Products
3. Determination of SNF Content in Milk
4. Determination of Titratable Acidity in Milk
5. Determination of Overrun in Icecream
6. Quality Testing of Butter
7. Quality Testing of Butter oil / Ghee
8. Analysis of Adulteration in Milk and Milk products

**III. Target group of users**

- UG (1<sup>st</sup> Year/ 2<sup>nd</sup> Year) [highest priority for development]
- UG (3<sup>rd</sup> Year/ 4<sup>th</sup> Year) [next higher priority for development]

**IV. Mapping of proposed lab with AICTE courses as per attached list of potential labs**

- Dairy Technology , KFT 602

**V. Mapping of proposed lab with universities (minimum 3 universities)**

- AKTU, Lucknow; KFT453; B. Tech. Food Technology
- IIT Kharagpur; AG39006; B. Tech. Agricultural and Food Engineering
- HBTU, Kanpur; TFT352; B. Tech. Food Technology
- Tezpur University, Aasam; FE 401; B. Tech: Food Engg & Technology
- CFTRI Mysore; FT 013; M.Sc.: Food Technology
  
- NIFTEM, Haryana; FST 222; B. Tech: Food Science & Technology
- Sant Longowal Institute of Engineering & Technology, Longowal, Punjab; PCFT-613;
- B.E. Food Engg & Technology

- Guru Nanak Dev University, Amritsar; FST-302; B. Tech: Food Technology
- Islamic University of Science & Technology, Pulwama, Jammu & Kashmir; DFT344C; B. Tech: Food Technology
- NIT, Rourkela; FP 3571; B. Tech. Food Technology

## VI. Expected timelines

Presentation of proposal to domain experts' committee – 31st March 2022

Demo of First 3 Expts and Review – 30th June 2022

Demo of 5-6 Expts and review – 31st August 2022

Demo of 7-10 Expts and review – 31st October 2022

Final demo of 7-10 Expts – 15th November 2022

Hosting of lab (7-10 Expts) – 30th November 2022

Note 1: The [LDC](#) will coordinate the [reviews](#) and [hosting](#)

Note 2: The lab is supposed to be developed and hosted within 6 - 9 months from the date of approval

## VII. Budget (Max. Rs 2 Lakhs per experiment with a ceiling of Rs 20 Lakhs per Lab)

**Table I. Budget for <Dairy Technology Lab>**

S. No.	Equipment/Activity	Budget # (In Rupees)
1	Laptop / Machine( <a href="#">computer/laptop</a> )	2.70
2	Manpower( <a href="#">project engineer/scientist</a> )	4.80
3	Consumables (various equipment including Spectrophotometer, Whatman filter paper, Funnels, Test tubes, Autoclave, Oven, PH Meter, etc)	4.00
4	Contingency ( <a href="#">Preparation of standard curve, Detection of Ammonium Compounds in Milk, Tests for Presence of Sulphates in Milk etc</a> )	4.00
5	Honorarium for Lab Developer (Rs 20k per experiment; Ceiling of Rs 2 Lakhs per lab)	2.50
6	Miscellaneous	2.00
<b>TOTAL</b>		<b>20 Lakhs</b>

# To be released based on the recommendation of the review committee

**Note:** Institute overheads not to be included in the budget

## VIII. Justification of the budget requirements

- (a) Details of Laptop/Machine  
A laptop/computer will be required for data-keeping.
- (b) Details of Manpower (number, cost per man-months etc.)
  - i. Total man-months required  
1 project staff
  - ii. No. of project staff, cost per man-months  
1 project engineer/scientist (~Rs. 40k per month)
  - iii. Honoraria for other staff associated with the project  
Honoraria for Faculty developing the Virtual Lab: (A maximum of Rs. 2 lakhs honorarium for the developers & Rs. 25k for reviews)  
Honoraria for Other staff associated with the project  
Rs. 25k honorarium for the associated staff
- (c) Details of Consumables  
Procurement of various equipment including Spectrophotometer, Whatman filter paper, Funnels, Test tubes, Autoclave, Oven, PH Meter etc.
- (d) Details of Miscellaneous cost
  - i. Internal Review (Optional, Rs 1000 per experiment)
  - ii. Field Trials - N.A.-
  - iii. Others - N.A.-
- IX. **Student Feedback and Learning**
  - How will you collect feedback and use them?
    - i. We will collect feedback through feedback (online/offline) form and workshops
    - ii. There is also an associated email id for providing feedback
    - iii. An expansion or additional explanation will be added if the need arises
  - What is the actual learning component provided by the Virtual Lab?
 

The learning component includes that student will study the analytical procedures for characterizing the properties of foods constituents and their interactions that affect the quality and stability of foods
  - After the Virtual Lab experience, would the student be able to perform the experiment in the real lab?
 

Yes, after the Virtual Lab experience, the student can perform the experiment in the real lab

## **ANNEXURE-I**

Important information for the development of Virtual Labs

(A Virtual Lab consists of 7-10 experiments)

**X. Link to some sample virtual labs**

<https://python-iitk.vlabs.ac.in/>      <https://cs-iitd.vlabs.ac.in/>      <https://plchla-coep.vlabs.ac.in/>

**XI. Technology Used**

- We will use HTML, CSS and Java Script for front-end design (free and open source)
- For Back-end we will use JSON (Free and open-source Software)

**XII. Required Components for virtual experiments**

- Step by step procedure similar to a physical lab will be drafted for the virtual lab
- Online manual with aim/objective and underlying theory
- Pre-test for understanding current status of user
- Simulator for learning the concept of food technology
- Post-test questions to check the understanding of student after using virtual lab
- Related resources (web & NPTEL lectures)
- Additional help/feedback