

**DR. VISHNURAJ M.R**

**Scientist, PhD – Livestock Products Technology**

**ICAR – National Research Centre on Meat, Hyderabad - 500092, India.**

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#### **EDUCATIONAL QUALIFICATION**

<b>S. No</b>	<b>NAME OF THE INSTITUTION</b>	<b>QUALIFICATION</b>	<b>DATE RECEIVED</b>
1.	ICAR-Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, India	PhD - Livestock Products Technology (LPT)	27 <sup>th</sup> July, 2020
2.	ICAR-Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, India	Post-Graduation (MVSc.) - Livestock Products Technology (LPT)	20 <sup>th</sup> July, 2013
3.	College of Veterinary & Animal Sciences, Mannuthy, Kerala Agricultural University, Kerala.	Graduation (BVSc & AH) - Veterinary Science & Animal Husbandry	20 <sup>th</sup> April, 2011
4.	Food Safety & Standards Authority of India (FSSAI)	Certified Food Analyst FSS Act 2006 (FSSAI)	31 <sup>st</sup> October, 2019

#### **PROFESSIONAL APPOINTMENTS**

**Institute Name** : ICAR – National Research Centre on Meat, Hyderabad, India.

**Position** : Scientist

**Laboratory** : Meat Species Identification Laboratory

**Accreditation** : ISO/IEC 17025: 2017 NABL Accredited; Referral Food Laboratory (FSSAI)

**Duration** : 2016 – Present

#### **COURSES, TRAININGS & SERVICES**

1. **National Livestock Mission** sponsored training course on “**Recent analytical techniques for detection of meat adulteration, veterinary drug residues and microbes of public health importance**” dated 15- 19<sup>th</sup> March, 2021.
2. Training on “**Molecular techniques for meat species and sex identification**” for Animal Husbandry Department officials from Uttarakhand, dated 17-22 February, 2020.
3. **Indian Council of Agricultural Research (ICAR)** sponsored short course (10 days) on “**DNA techniques in forensic food analysis**” (**Strategies to combat economically motivated adulteration and frauds in foods of animal origin**) dated 14-23 October, 2019 at ICAR-National Research Centre on Meat, Hyderabad.
4. **Department of Extension, Ministry of Agriculture and farmers welfare**, sponsored training course (8 days) on “**Quality and safety issues in Indian meat sector with reference to Food safety Act, 2006**” dated 2-9, September, 2019 at ICAR-National Research Centre on Meat, Hyderabad.
5. Skill development program on “**Hygienic handling, storage, processing of meat and meat products**” for **Karnataka Sheep & Wool Development Corporation Ltd**, Bangalore, dated 04-06<sup>th</sup> July, 2019.
6. **Food Safety and Standards Authority of India (FSSAI)** sponsored training program (3 days) on “**Good Food Laboratory Practices**” dated 25-27<sup>th</sup> June, 2019 at ICAR-National Research Centre on Meat, Hyderabad.

7. **National Livestock Mission** sponsored capacity building program for farmers on “**Clean meat production and meat value addition**”, 2019.
8. **Entrepreneurship Development program on Value added meat products processing**, dated 10-15<sup>th</sup> September 2018 at ICAR-National Research Centre on Meat.
9. **National Livestock Mission** sponsored capacity building program for veterinarians in “**Meat quality testing and molecular techniques for detection of meat adulteration**” during 17-20<sup>th</sup> Jan, 2018 and 6-9<sup>th</sup> Feb, 2018.
10. Skill Development program (7 days) on “**DNA based techniques for forensic food analysis**” dated 2-9<sup>th</sup> July, 2018.
11. Training on “**Meat Products Processing for youths of North Eastern Region.**” from 27-31<sup>st</sup> March, 2017.
12. Guided the final year undergraduate research work (2021) of **Mr. Aravind Kumar N - B. Tech Biotechnology** student from Sree Sastha Institute of Technology, Chennai on the work “**Development and validation of a droplet digital PCR (ddPCR) technique for detection and quantification of buffalo derived materials in foods and feedstuffs**”.
13. **External examiner**, MVSc course: Market milk processing and dairy plant procedure & Egg and egg products technology, 2021 for **Kerala Veterinary & Animal Sciences University**, Kerala. And B. Tech Food Technology course 2019-20, by **University of Agricultural sciences**, Dharward, Karnataka.
14. **Internship training program of PG students** from Veterinary college, Namakkal, TN dated 12/03/2018 to 16/03/2018 and for **MVSc. students** from KVASU, Kerala and final year **BVSc & AH students** of College of Veterinary Science, Rajendranagar, Hyderabad during 12/07/2017 to 14/07/2017.
15. Institute support as ‘**Technical manager & Deputy Quality manager**’, ‘**In charge of Nucleotide Sequencing facility**’, ‘**In charge of Referral food laboratory**’, **Contact person for “INfoLNET, NABL, Food - ‘O’ - Copoeia and ‘Customer sample analysis”** in Meat Species Identification Laboratory of ICAR – National Research Centre on Meat (Home Institution).
16. Team member for Agribusiness Incubator, Institute Technology Management Unit, Institute Biosafety Committee, MGMG program and Purchase Advisory Committee (Home Institution).

## JOURNAL PUBLICATIONS

1. Radhakrishna Sahu, R., **Vishnuraj, M.R.**, Srinivas, Ch., Dadimi, B., Megha, G.K., Pollumahanti, N., Malik, S.S., Vaithiyanathan, S., Rawool, D.B. & Barbudde, S.B. (2021). Development and comparative evaluation of droplet digital PCR and quantitative PCR for the detection and quantification of *Chlamydia psittaci*. *Journal of microbiological methods*. Accepted – 30<sup>th</sup> August, 2021.
2. **Vishnuraj, M. R.**, Devatkal, S., Vaithiyanathan, S., Kumar, R. U., & Mendiratta, S. K. (2021). Development and validation of miRNA based method for rapid identification of offal meats in processed chicken meat products. *Food Control*, 121, 107593. <https://doi.org/10.1016/j.foodcont.2020.107593>
3. **Vishnuraj, M. R.**, Devatkal, S., Vaithiyanathan, S., Kumar, R. U., Srinivas, C., & Mendiratta, S. K. (2021). Detection of giblets in chicken meat products using microRNA markers and droplet digital PCR assay. *LWT*, 140, 110798. <https://doi.org/10.1016/j.lwt.2020.110798>
4. Vaithiyanathan, S., **Vishnuraj, M. R.**, Reddy, G. N., & Srinivas, C. (2020). Authentication of camel meat using species-specific PCR and PCR-RFLP. *Journal of Food Science and Technology*, 1-8. <https://doi.org/10.1007/s13197-020-04849-w>.
5. **Vishnuraj, M. R.**, Shukla, K. G. V., Kumar, U., Srinivas, C., Sowmya, M., &

- Vaithyanathan, S. (2020). Correlation of spoilage microflora in chiller stored buffalo meat with chemical indicators. *Journal of Indian Veterinary Association*. [http://krishi.icar.gov.in/PDF/ICAR\\_Data\\_Use\\_Licence.pdf](http://krishi.icar.gov.in/PDF/ICAR_Data_Use_Licence.pdf)
6. **Vishnuraj, M. R.**, Devatkal, S., Vaithyanathan, S., Mendiratta, S. K., Kumar, R. U., Srinivas, C., & Sowmya, M. (2020). Chicken RNA Integrity Assessment through Capillary Electrophoresis for miRNA Expression Study using RT-qPCR. *Int. J. Curr. Microbiol. App. Sci*, 9(2), 215-221. <https://doi.org/10.20546/ijemas.2020.902.027>
  7. Devatkal, S. K., **Vishnuraj, M. R.**, Kulkarni, V. V., & Kotaiah, T. (2018). Carcass and meat quality characterization of indigenous and improved variety of chicken genotypes. *Poultry science*, 97(8), 2947-2956. <https://doi.org/10.3382/ps/pey108>
  8. Vaithyanathan, S., **Vishnuraj, M. R.**, Reddy, G. N., & Kulkarni, V. V. (2018). Application of DNA technology to check misrepresentation of animal species in illegally sold meat. *Biocatalysis and Agricultural Biotechnology*, 16, 564-568. <https://doi.org/10.1016/j.bcab.2018.10.012>
  9. **Vishnuraj, M. R.**, Kandeepan, G., Shukla, V., Kumar, S., Singh, B. P., Bhattacharya, D., & Sharma, H. (2017). Development and Evaluation of an Enzyme Based Time Temperature Integrator (TTI) for Monitoring Meat Quality. *Journal of Meat Science*, 12(1), 23-26.
  10. **Vishnuraj, M. R.**, Gurunathan, K., & Shukla, V. (2017). Development and evaluation of time-temperature integrator for monitoring high temperature thawing of frozen buffalo meat. *Turkish Journal of Veterinary and Animal Sciences*, 41(4), 496-505.
  11. Shukla, V., Kandeepan, G., **Vishnuraj, M. R.**, & Soni, A. (2016). Anthocyanins based indicator sensor for intelligent packaging application. *Agricultural research*, 5(2), 205-209. <https://doi.org/10.1007/s40003-016-0211-0>
  12. **Vishnuraj, M. R.**, Kandeepan, G., Rao, K. H., Chand, S., & Kumbhar, V. (2016). Occurrence, public health hazards and detection methods of antibiotic residues in foods of animal origin: A comprehensive review. *Cogent OA Food & Agriculture*, 2(1), 1235458. <https://doi.org/10.1080/23311932.2016.1235458>
  13. Kattoor, J. J., Malik, Y. S., Sasidharan, A., **Rajan, V. M.**, Dhama, K., Ghosh, S., ... & Singh, R. K. (2015). Analysis of codon usage pattern evolution in avian rotaviruses and their preferred host. *Infection, Genetics and Evolution*, 34, 17-25. <https://doi.org/10.1016/j.meegid.2015.06.018>
  14. Shukla, V., Kandeepan, G., & **Vishnuraj, M. R.** (2015). Development of on-package indicator sensor for real-time monitoring of buffalo meat quality during refrigeration storage. *Food Analytical Methods*, 8(6), 1591-1597. <https://doi.org/10.1007/s12161-014-0066-6>
  15. Shukla, V., Kandeepan, G., & **Vishnuraj, M. R.** (2015). Development of on package indicator sensor for real-time monitoring of meat quality. *Veterinary World*, 8(3), 393. <https://dx.doi.org/10.14202%2Fvetworld.2015.393-397>
  16. Shukla, V., Kandeepan, G., & **Vishnuraj, M. R.** (2015). Evaluation of shelf life of buffalo meat in aerobic cold storage using physicochemical parameters. *Buffalo Bulletin*, 34(4), 453-457.
  17. **Vishnuraj, M. R.**, Kandeepan, G., & Shukla, V. (2014). Effect of higher temperature exposure on physicochemical properties of frozen buffalo meat. *Veterinary World*, 7(11). <https://doi.org/10.14202/vetworld.2014.909-915>
  18. **Vishnuraj, M. R.**, Talukder, S., Kandeepan, G., Mendiratta, S. K., Shukla, V., & Sharma, B. D. (2014). Development and evaluation of restructured chicken rolls incorporated with antioxidant rich fruit pulp. *Indian Journal of Poultry Science*, 49(3), 297-301.
  19. **Vishnuraj, M. R.**, Kandeepan, G., Vivek Shukla, M. S., Arun, T. R., & Agarwal, R. K.

(2014). Estimation of microbial load in high temperature thawed buffalo meat using fluorescein diacetate (FDA) hydrolysis assay. *J Pure Appl Microbiol*, 8, 4851-4857.

### BOOKS PUBLISHED

1. Adulteration and fraudulency in foods of animal origin: Challenges in Veterinary services and advances in molecular diagnostics. (2021). Published by ICAR – NRC on Meat. ISBN: **978-93-5473-105-1**.
2. Molecular techniques for forensic analysis of foods of animal origin. (2019). Published by ICAR – NRC on Meat. Pp: 126. ISBN: **978-93-5391-239-0**.
3. Vaithyanathan, S and Vishnuraj, M. R (2018). Skill development program on DNA techniques in forensic food analysis. Strategies to combat economically motivated adulteration and frauds in foods of animal origin. Published by ICAR-NRC on Meat.

### WORKSHOPS, SEMINARS & CONSULTATIONS

1. Invited lecturer on ‘**Application of Droplet digital PCR in food forensics**’ during National workshop on ‘Emerging Technology Droplet Digital™ PCR’ dated September, 1-3, 2021 at Osmania University, Hyderabad.
2. Co-ordinating weekly online lecture series (60 weeks) in related to ‘meat science and one health’ as part of 75 years of India’s independence.
3. Coordinated National Workshop cum brainstorming session on “**Quality and safety challenges in foods of animal origin**” under the aegis of Network of Scientific Cooperation for Food Safety and Applied Nutrition (**NetSCoFAN**) during 28<sup>th</sup> January, 2020 at ICAR – NRC on Meat, Hyderabad.
4. Coordinated Workshop on **Intellectual property right (IPR) for technology commercialization (ToT)** on 15<sup>th</sup> February, 2020 at ICAR – NRC on Meat, Hyderabad.
5. Organized the **World Food Safety Day** on 7<sup>th</sup> June 2019 under the theme “**Food Safety, Everyone’s Business**” to commemorate the initiative of Food and Agriculture Organization of the United Nations.
6. Consultancy project on “Value added meat (pork) processing” with M/s Lavya mutually aided co-operative pig farming and pork marketing society, Medchal, Telangana.
7. Consultancy project on “Establishment of slaughter house for goat” with M/s. VIJ Estates Pvt. Ltd., Hyderabad, Telangana.
8. Consultancy project on” Establishment of value added meat products processing” Ms. Lazeez Eats, Hyderabad.
9. Contract research on “Evaluation of consumer preference and meat quality characteristics of slow growing and fast growing broiler birds” **Indbro Farms**, Hyderabad.
10. Invited lecture on **Genomic approaches for forensic food fraud analysis**” during “Recapitulation of omics technologies ..”, Organized by College of Veterinary and Animal sciences, Parbhani, Maharashtra, dated 2-22, May, 2019.

### MEMBERSHIPS AND ACTIVITIES

1. Indian Poultry Science Association (IPSA), ICAR – Central Avian Research Institute (2013 – present).
2. Indian Association of Veterinary Public Health Specialists (IAVPHS): ICAR – Indian Veterinary Research Institute (2013 – present).
3. Indian Meat Science Association (IMSA), ICAR – National Research Centre on Meat (2015 – present) (**Member of Editorial Board, Journal of Meat Science**)
4. Kerala State Veterinary Council, Kerala (2010 – present)
5. Veterinary Council of India, New Delhi, India (2014 – present).
6. Association of Meat Scientist and Technologist (AMST), India (2020 – present).

## HONORS & AWARDS

1. Recognized as 'Evaluation committee member', Agricultural and processed food products export development agency APEDA – National Program on Organic Production (NPOP), 2021.
2. Received "Certificate of Appreciation" from Director, ICAR-National Research Centre on Meat for the establishment of "ISO/IEC 17025: 2017 NABL Accredited laboratory" and "Nucleotide Sequencing Instrumentation Facility", 2021.
3. Received "Best Performing Scientist" certificate of appreciation from Director, ICAR-National Research Centre on Meat, for contributions for R&D and institute activities during 2019 and 2020.
4. Short Term Mission on Better Training for Safer Food (BTSF) mission of European Union (EU) in India on Risk Assessment dated 12-16<sup>th</sup> November, 2018, at FSSAI HQ, New Delhi, India & 27-31<sup>st</sup> May, 2019, Kerala, India.
5. Received letter of appreciation from Director General, ICAR and Deputy Director General, Animal science, ICAR for implementing ISO/IEC 17025: 2005 Laboratory Quality Management System in the Meat Species Identification Laboratory, 2021.
6. Received "Best Research Article" for the year 2020 from Journal of Indian Veterinary Association for the manuscript "Correlation of spoilage micro flora in chiller stored buffalo meat with chemical indicators".
7. Nominated by Chairman, Slaughter house and Meat Industry Sectional Committee (FAD 18), Bureau of Indian Standards, as a Panel member, for pork related products standards, 2019.
8. Received "Award Certificate" for 'Best Poster Presentation' during International Symposium and 9<sup>th</sup> Conference of Indian Meat Science Association (IMSACON), during 6-8 November, 2019.
9. Received "Indian Meat Science Association – Best Paper Award, 2017" (Journal of Meat Science), from Indian Meat Science Association, during the International Symposium and 8<sup>th</sup> Conference of Indian Meat Science Association (IMSACON), 22-24<sup>th</sup> November, 2018.
10. Received 'Best oral presentation' (second) for the research abstract during International Symposium and 8<sup>th</sup> Conference of Indian Meat Science Association (IMSACON), 22-24<sup>th</sup> November, 2018 & 'Best oral presentation' (first) in the 7<sup>th</sup> conference of Indian Meat Science Association, November 10-12, 2015, Ludhiana, India.
11. Acquired Senior Research Fellow Position by ICAR's All India Competitive Examination for Senior Research Fellowship (PGS)-2014 [AICE-SRF (PGS)-2014] in the discipline of Livestock Products Technology.
12. Cleared University Grants Commission – National Eligibility Test (UGC - NET) in the year 2014.
13. Cleared Indian Council of Agricultural Research – National Eligibility Test (ICAR - NET) in the year 2013.
14. Awarded with Department of Science and Technology (DST), DST INSPIRE Fellowship for PhD program, 2013.
15. 'Best Student Award' from ICAR-Indian Veterinary Research Institute IVRI (Deemed University), India for academic achievements during the post-graduation studies, 2013.
16. Received "Best Oral Presentation" at 5<sup>th</sup> Annual Conference and National Symposium Of Indian Meat Science Association, (IMSACON V), 2013.
17. Received "Best Poster Presentation" at 5<sup>th</sup> Annual Conference and National Symposium Of Indian Meat Science Association, (IMSACON V), 2013.

18. Received ‘**Certificate of Excellence**’ from **Indian Veterinary Association, Kerala Chapter** for securing **2<sup>nd</sup> rank in AIEEA-PG-2011** examination.
19. Acquired **ICAR-JRF (PGS)** in 16<sup>th</sup> All India Entrance Examination (**AIEEA-PG-2011**) in **Animal Science stream**, issued by **Indian Council of Agricultural Research**.

#### **OUTREACH & EXTENSION ACTIVITIES**

1. Established India’s **first ISO/IEC 17025:2017 NABL Accredited laboratory** (Meat Species Identification Laboratory, ICAR - NRCM) for the purpose of **species identification of meat & meat products** (12 species of food animals & birds) and **for Halal Compliance detection of meat and meat products and Wild life animal species identification**.
2. Providing **analytical services** to various regulatory agencies for **animal species identification, detection of food adulteration, EMA, test for halal compliance, wild life meat speciation and test for presence of animal origin DNA**. So far 400 evidence samples were analyzed.
3. Audited as per **ISO/IEC 17025: 2017** the State Laboratory for Livestock, Marine & Agriculture Products (**SLMAP**), Animal Husbandry Dept., Govt. of Kerala for NABL accreditation of their Bovine species identification laboratory.
4. **Nominated by FSSAI** to work as **faculty member** for **Induction Training for Food Safety Officers** (Sampling & Laboratory Network).
5. Trained **Internal Auditor** for ISO 9001:2015, ISO 17025:2005, ISO 17025:2017 and ISO 17034:2016.
6. Development of Food products category monographs (**Food - ‘O’ - Copoeia**) for foods of animal origin (Meat and meat products; egg & egg products).
7. Activities under Network for Scientific Co-operation in the Area of Food Safety and Applied Nutrition (NetSCoFAN).
8. Organized **Exhibition during World Food India**, New Delhi to showcase the activities/services of National Research Centre on meat to the larger public, dated 3-5<sup>th</sup> Nov, 2017.
9. Organized **Exhibition during Poultry India Expo**, Hyderabad, to showcase the activities/services of NRC on meat to the larger public, dated 22-25<sup>th</sup> Nov, 2017.
10. Organized exhibition during **Krishi Kumbh**, Regional Agriculture Fare at Muzafar Nagar, Uttar Pradesh, 28<sup>th</sup>-30<sup>th</sup> November, 2016.
11. Completed **five ‘proficiency testing’** for **Meat Authenticity (Beef)**, as per NABL norms and ISO 17043:2010, **through Fera Science Limited, UK**.
12. Organized **Exhibition during Agricultural Science Exhibition** during **14<sup>th</sup> Agricultural Science Congress (ASC) and Agri Tech** dated 20-23<sup>rd</sup> February 2019 at NASC Complex, New Delhi.
13. Organized **Front-Line Demonstration (FLD)** on 27<sup>th</sup> Feb, 2020, with 125 participants on Meat value addition, at Kothur village under the MGMG program.
14. Lecture on “**Meat adulteration and differential diagnostic interventions**” at TSVBRI, Hyderabad; hand holding with various animal husbandry laboratories for establishing meat speciation laboratories.