# DEPARTMENT OF ANIMAL GENETICS AND BREEDING

**College of Veterinary Science & Animal Husbandry**

**Navsari Centre (Kamdhenu University), Gandhinagar**

**Eru Char Rasta, Vijalpore, Ta: Jalalpore, Dist. Navsari - 396450**

## Teaching Faculty in Department

| Sr. No. | Name | Designation | Contact Details | Joining Year in NAU | Qualification | Total Experience | Publications Research Papers |
|---|---|---|---|---|---|---|---|
| 1 | Dr. V. B. Kharadi | Professor & Head | 9974061973 vbkharadi@kamdhenuuni.edu.in | 2009 | Ph.D. | 36 Years | 53 |
| 2 | Dr. Mamta Janmeda | Associate Professor | 9925319981 janmedamamta@kamdhenuuni.edu.in | 2009 | Ph.D. | 12 Years | 20 |

## ABOUT THE DEPARTMENT

DepartmentofAnimalGeneticsandBreedingisfunctioningsincetheestablishmentof the college in year 2008 under *VanbandhuKalyanYojna*of Hon. Chief Minister's ten pointsprogramme. The department is engaged in impartingquality education to undergraduateand postgraduate students, to undertake research projects in the fields of animal genetics suchas cytogenetics, molecular genetics, population genetics andanimal breeding for the benefit of the society.

## Research Projects (External agency / Institutional project)

At present, the department has well established Cytogenetics andMolecular geneticslaboratories.Thedepartment has carried out research projects in the fields of Cytogenetics as well as Molecular Genetics as follows funded by Navsari Agricultural University.

| Sr. No. | Title of the research projects | Area of work | Status |
|---|---|---|---|
| 1. | Cytogenetic Screening of SurtiBuffalo | Cytogenetics | Completed |
| 2. | Analysis of Chromosomal Abnormalities in Surti Buffalo Using Fluorescence *In Situ* Hybridization (FISH) | Cytogenetics | Completed |
| 3. | Study of genetic polymorphism in growth related genes and its association with growth parameters in Surti goats | Molecular Genetics | Completed |
| 4. | Relative gene expression study on casein | Molecular | Completed |

| | | | |
|---|---|---|---|
| | protein and its regulatory genes in mammary epithelial cells of Surti goat | Genetics | |

**Recommendations for Scientific community**

| Sr. No. | Title of the research projects | Recommendation |
|---|---|---|
| 1. | Study of genetic polymorphism in growth related genes and its association with growth parameters in Surti goats (PI: Dr. Gaurav Pandya) | Surti goats with BB (366 and 56 bps) genotype are found with higher body weight at 6 months of age as compared to AB (422, 366 and 56 bps) genotype when growth hormone (GH) gene is amplified using forward primer 5' CTCTGCCTGCCCTGGACT 3' and reverse primer 5' GGAGAAGCAGAAGGCAACC 3' and digested with *HaeIII* restriction enzyme. |
| 2. | Relative gene expression study on casein protein and its regulatory genes in mammary epithelial cells of Surti goat(PI: Dr. Mamta Janmeda) | The Mammary Epithelial Cells can be successfully recovered in sufficient quantity from optimum amount of milk (800 ml) of Surti goats using antibody mediated magnetic bead separation and can be further used for recovering RNA for down step quantification of major milk Casein protein gene and its regulatory gene's expression. |
| 3. | Relative gene expression study on casein protein and its regulatory genes in mammary epithelial cells of Surti goat(PI: Dr. Mamta Janmeda) | The relative gene expression of CSN1S1, CSN1S2, CSN3 and C/EBP genes show upregulation with advancement of lactation from 30 days to 90 days post partum in Surti goats with 7.79, 32.87, 21.41 and 24.68 fold increase respectively. The relative gene expression of CSN1S2, CSN3 and C/EBP genes show positive correlation with protein percent at 30 days and 90 days post partum in Surti goats. Positive correlations also shown by CSN2 with Test Day Milk Yield and CSN3 with Cumulative Milk Yield at day 30 post partum in Surti goats. |

## Achievements and List of Research Publications

### A). Lead Papers in National Seminar /Conference/Symposium

1. Mamta Janmeda, Pandya, G. M., Ramani, U. V., Dangar, N. S., Kharadi, V. B. and Brahmkshtri, B. P. (2014). Dairy Animal Breeding Policy and Programme. National conference of Indian Association of Women Veterinarians. pp 35-39.
2. Mamta Janmedaand Menaka R.(2014). Gender and Livestock: Opportunities and Challenges.National conference of Indian Association of Women Veterinarians. Pp 88-91.
3. R. Menaka andMamta Janmeda (2014). Effect of climatic change in human race and other species habitats on our planet.National conference of Indian Association of Women Veterinarians. pp 189-191.
4. Tyagi K. K., Brahmkshtri B. P., Kharadi V. B., Ramani U. V., Pandya G. M., Janmeda M.and Dangar N. S.(2019). Breeding Policies for Improving Productivity of

Indian Buffalo – An Overview. National conference - ISBD on "Enhancing Rural Livelihood through Improved Buffalo Productivity and Health" 17-19 January, 2019 at College of Veterinary Science and Animal Husbandry, Navsari Gujarat.pp 41-47.

5. Dangar N. S., Pandya G. M. Ramani U. V., Brahmkshtri B. P., Kharadi V. B. Janmeda M. and Tyagi K. K. Scope of Genomic Selection to Improve Buffalo Productivity in India.National conference - ISBD on "Enhancing Rural Livelihood through Improved Buffalo Productivity and Health" 17-19 January, 2019 at College of Veterinary Science and Animal Husbandry, Navsari Gujarat. pp48-54.
6. Janmeda M., Pandya G. M., Ramani U. V., Dangar N. S., Tyagi K. K.Brahmkshtri B. P and Kharadi V. B. Gene Expression of Major Lipogenic Genes during Lactogenesis in Buffaloes. National conference - ISBD on "Enhancing Rural Livelihood through Improved Buffalo Productivity and Health" 17-19 January, 2019.at College of Veterinary Science and Animal Husbandry, Navsari Gujarat.pp 80-86.

**B). Research Publications in national/ international journals:**

1. G.M. Pandya, C.G. Joshi, D.N. Rank, V.B. Kharadi, B.P. Bramkshtri, P.H. Vataliya, P.M. Desai and J.V. Solanki (2013). Genetic analysis of Production and Reproduction Traits in Surti Buffalo on an Organised Farm. Indian J. Dairy Sci. 66(3): 235-242.
2. Pandya, G. M., Ramani, U. V., Janmeda, M., Dangar, N. S., Tyagi, K., Brahmkshtri, B. P. and Kharadi, V. B. (2014). piRNA: Basics and their Association with PIWI proteins. *Current Trends in Biotechnology and Pharmacy*. 8 (3): 303-308.
3. G.M. Pandya, C.G. Joshi, D.N. Rank, V.B. Kharadi, B.P. Bramkshtri, P.H. Vataliya, P.M. Desai and J.V. Solanki (2015). Genetic analysis of Body weight traits of Surti buffalo *Buffalo Bulletin* 34(2): 189 – 195.
4. Yadav, B.L.; Ramani U.; Pandya G. and Brahmkshtri, B. (2015) Study of Leptin Gene Polymorphism In Surti and Jaffarabadi Buffaloes by PCR-RFLP. *Current Trends in Biotechnology and Pharmacy* 9 (2): 151-156
5. Pandya, G. M., Dangar, N. S., Janmeda, M., Gadhvi, Y.S., Brahmkshtri, B. P. and Kharadi, V. B. (2016). Standard Karyoytype of Surti Buffalo from an Organized Farm. *International Journal of Science, Environment and Technology* 5(3):1108-1115.
6. Tyagi, K., Brahmkshtri, B. P., Ramani, U. V., Kharadi, V. B., Pandya, G. M., Janmeda, Mamta., Ankuya , K. J., Patel, M. D. and Sorathiya, L.M. (2016). Test day variability in yield and composition of surti and mehsanibuffaloes milk at 15 and 60 postpartum. *Veterinary world* 9: 595:600.
7. Mamta Janmeda, Pandya, G. M., Ramani, U. V., Kharadi, V. B., Tyagi, K. K. and Brahmkshtri, B. P. (2016). Copy Number Variations in Livestock: An Overview. *International Journal of Science, Environment and Technology* 5(5):3494-3505.
8. K. K. Sharma, I. H. Kalyani, D. R. Patel and G. M. Pandya (2016). Enumeration Techniques of Newcastle Disease Virus (NDV) for OncolyticVirotherapy 2 *Journal of Animal Research* 6(5): 905-910
9. Mamta Janmeda, Ramani, U.V., Pandya, G.M., Tyagi, K., Kharadi, V.B., Brahmkshtri, B.P., Jyotishree Bayan and Pawar, V.D. (2017). Epigenetics: Regulation

of Gene expression. *International Journal of Science, Environment and Technology* 6(2): 1390 – 1396.

10. Janmeda M, Kharadi V, Pandya G, Brahmkshtri B, Ramani U, Tyagi K (2017) Relative gene expression of fatty acid synthesis genes at 60 days postpartum in bovine mammary epithelial cells of Surti and Jafarabadi buffaloes *Veterinary World* 10(5): 467-476.
11. Mamta Janmeda, Vishnu Kharadi, Gaurav Pandya, Balkrushna Brahmkshtri, Umed Ramaniand Kuldeep Tyagi (2017). Variation in Test Day Milk Yield and Composition at Day 15 and 60 Postpartum in Surti and Jafarabadi Buffaloes. *Journal of Animal Research* 7(3): 451-458.
12. GM Pandya, UV Ramani, Mamta Janmeda, KK Tyagi, VB Kharadi, NS Dangar, PU Gajbhiye, and BP Brahmkshtri. (2017). Variability in test day milk yield and milk composition at day 15 and 60 of lactation in Surti and Jaffarabadi buffaloes. Indian J Dairy Sci 70(6):763-766.
13. Gaurav Pandya, Umed Ramani, Mamta Janmeda, Kuldeep Tyagi, Balkrushna Brahmkshtri and Vishnu Kharadi. (2018). Relative gene expression analysis of β-casein gene and its transcription regulatory genes in primary buffalo mammary epithelial cells of Surti and Jaffarabadi buffaloes. Indian Journal of Animal Sciences88 (3): 319–00.
14. Gaurav Pandya, Umed Ramani, Mamta Janmeda, Vishnu Kharadi, Balkrushna Brahmkshtri and Kuldeep Tyagi. (2018). Relative gene expression analysis of β-casein milk protein and its transcription regulatory genes in Surti buffalo. *International Journal of Livestock Research.* 8(4):121–127.
15. Jyotishree Bayan, Vishnu Kharadi, Umed Ramani, Mamta Janmeda, PawarVallabh and Balkrishna Brahmkshtri.(2018). Polymorphism of Exon 2-3 of Growth Hormone Gene in Surti and Mehsani Goats by PCR-RFLP. *International Journal of livestock Research.*8(11): 49–57.
16. Jyotishree Bayan, Vishnu Kharadi, Umed Ramani, Mamta Janmeda, Kuldeep Tyagi, Nikhil Dangar and Gaurav Pandya. (2018). Genetic Polymorphism of Growth Hormone Gene Exon-4 in Surti and Mehsani Goats by PCR-RFLP. *The Indian Journal of Veterinary Sciences & Biotechnology.*14 (1): 28-33.
17. V Pawar, B Brahmkshtri, GM Pandya, M Janmeda, NS Dangar, J Bayan and K Tyagi. (2018). Non genetic factors affecting lactation milk yield and estimation of genetic, environmental and phenotypic trends in Surti buffalo. *Indian J Dairy Sci*71(5): 491-495.
18. Chaudhary M M, Khasetiya C T, Chaudhary N F,Tyagi K K, Kharadi V B and Atara V B. (2018). Synchronization of estrous by buck effect and PGF2α treatment in Surti does. *The Indian Journal of Veterinary Sciences & Biotechnology.*13 (3): 55-59.
19. Pawar, V., Dangar, N., Pandya, G., Brahmkshtri, B., Kharadi, V. & Bayan, J. (2019). Non Genetic Factors Affecting Calving Interval in Surti Buffaloes. International Journal of Livestock Research 9(5): 144-148.
20. Sorathiya L M, V. B. Kharadi, A. P. Raval, K. H. Sadharakiya, K. K. Tyagi and M. A. Katariya (2019) Parametric Estimation of Factors Associated with Prediction of

Calving in Surti Buffaloes Using Ordinal Regression. International Journal of Livestock Research, 9 (01) eISSN : 2277-1964.

21. Atara V.B., Chaudhri C.F., Tyagi K.K., Chaudhry M.M., Kharadi V.B. and Dabas V.S. (2019) Attributes of Surti buck semen in rainy and dry seasons. Indian journal of Small Ruminants. 25(1):115-117. ISSN 0973-9718.
22. Sandhya Chaudhary, Rana Ranjeetsingh, V K Singh, T D Manat, V B Kharadi and L M Sorathiya (2019). Effect of heat ameliorative measures on microclimate, physiological, blood biochemical parameters and milk production in lactating Surti buffaloes. Indian Journal of Animal Sciences 89 (1): 97–104.
23. Sukhadiya M L., Thakur N S., Patel V R., Gunaga R P., Kharadi V.B., Tyagi K K. and Susheel Singh (2019) Provenance variations in proximate principles, mineral matter, total phenols and phytochemicals of Meliadubia drupes: An unexplored alternate livestock feed stock. Journal of Forestry Research http://doi.org/10.1007/s11676-019-01080-y.
24. Mamta Janmeda, Gaurav Pandya, Umed Ramani, Balkrushna Brahmkshtri, Navin Patel, Vishnu Kharadi (2020). Relative Gene Expression Study on Casein Protein and its Regulatory Genes in Mammary Epithelial Cells of Surti Goat. *The Indian Journal of Veterinary Sciences & Biotechnology.*16 (1):54-57.

**Awards / Achievements:**

1. Dr. Mamta Janmeda, Asst. Professor, has undergone a three months International training programme at Texas A & M University, Texas, USA during May 6- Aug 3, 2013.
2. Best Paper Award for the research paper "Analysis of Chromosomal Abnormalities by Advanced Molecular Cytogenetics" by Mamta Janmeda, BhanuChowdhary, TerjeRaudsepp and Sharmila Ghosh., in National Seminar during August 26 -28, 2014 at Anand, Gujarat.
3. Best Poster Award for the research paper"Study of Leptin Gene Polymorphism in Surti and Jaffarabadi Buffaloes byPCR-RFLP" by Yadav, B.L., Ramani U., Pandya G. and Brahmkshtri, B.P.in National Seminar during October 09-11, 2014 at Navsari, Gujarat.
4. Best Poster Award for the research paper "Copy Number Variation Analysis in Goat Genome" by Mamta Janmeda, BhanuChowdhary, TerjeRaudsepp and Sharmila Ghosh in National Seminar during October 09-11, 2014 at Navsari, Gujarat.
5. Best Poster Award for the research paper "Relative gene expression of fatty acid synthesis genes at 60 day postpartum in bovine mammary epithelial cells of Surti and Jafarabadi buffaloes" by Mamta Janmeda, Vishnu Kharadi, Gaurav Pandya, Balkrishna Brahmkshtri, Umed Ramani and Kuldeep Tyagi in National Symposium during February, 08-10, 2017 at College of Veterinary and Animal Sciences, Mannuthy, Thrissur, Kerala.
6. Best Oral Presentation Award for the research paper "Relative Gene Expression Analysis of β-casein milk protein gene and its transcription regulatory genes at two stages of lactation in Jafrabadi buffaloes" by Gaurav Pandya, Umed Ramani, Mamta Janmeda, Vishnu Kharadi, Balkrushna Brahmkshtri, Nikhil Dangar, Kuldeep Tyagi

and P. U. Gajbhiye in National Seminar and V$^{th}$ Annual Convention of Society for Veterinary Sciences and Biotechnology (SVSBT) during September 22 – 23, 2017 held at College of Veterinary Science and Animal Husbandry of Orissa University of Agriculture and Technology, Bhubaneshwar, Orissa.

7. Best Oral Presentation Award for the research paper "Growth Hormone Polymorphism in Surti and Mehsani Goats by PCR-RFLP" by Jyotishree Bayan, Vishnu Kharadi, Umed Ramani, Mamta Janmeda, Gaurav Pandya, Balkrushna Brahmkshtri, Nikhil Dangar, and Kuldeep Tyagi in National Seminar and V$^{th}$ Annual Convention of Society for Veterinary Sciences and Biotechnology (SVSBT) during September 22 – 23, 2017 held at College of Veterinary Science and Animal Husbandry of Orissa University of Agriculture and Technology, Bhubaneshwar, Orissa.
8. Best Oral Presentation award for "Expression Study of Fatty Acid Synthesis Genes at 15 and 60 Day Postpartum in Bovine Mammary Epithelial Cells of Surti Buffaloes" by Janmeda M., Pandya G. M., Ramani U. V., Dangar N. S., Tyagi K.K., Kharadi V. B. and Brahmkshtri B. P. in National conference - ISBD on "Enhancing Rural Livelihood through Improved Buffalo Productivity and Health" 17-19 January, 2019 at College of Veterinary Science and Animal Husbandry, Navsari Gujarat.
9. Best Paper award -2019 with cash prize (felicitation) of the Indian Journal of Veterinary Sci and Biotechnology by Jyotishree Bayan, Vishnu Kharadi, Umed Ramani, Mamta Janmeda, Kuldeep Tyagi, Nikhil Dangar and Gaurav Pandya in National Seminar SVSBT-2019 on "Biotechnological Advances for improving Animal Health and Productivity held on 5th- 6th December, 2019 at College of Veterinary Science A. H., Navsari ,Gujarat.
10. Best Paper award -2021 with cash prize (felicitation) of the Indian Journal of Veterinary Sci and Biotechnology by Mamta Janmeda et.al in VIII Annual Convention of Society for Veterinary Science and Biotechnology and National Seminar SVSBT-2021 on "Innovative Biotechnological Approaches for Enhancing Fertility, Health and Productivity of Livestock to Boost the Farmers' Economy" held during 17-18 December, 2021 at College of Veterinary Science and A. H., ANDUAT, Kumarganj, Ayodhya.

## 11. Future Plan

The department aims to continue imparting best quality education for undergraduate and postgraduate teaching in the field of Animal Genetics and Breeding. As the department is having a well-established cytogenetics and molecular genetics laboratory, the department aims to develop a referral Molecular and Cytogenetics laboratory in the South Gujarat region which has all the facilities to solve the query pertaining to Genetics and Animal Breeding at organizational or farmer's level. The department also aims to collaborate with the renowned centres / laboratories working in the field of Animal Genetics and Breeding at national or international level.

Moreover, some of the thrust areas of research have been identified in which the departmental faculties should be trained, are mentioned below.

- Advanced Molecular Cytogenetics
- Advanced Molecular Genetics
- Animal Breeding Data analysis

## Courses offered by the Department (Theory and Practical)

**Undergraduate Programme**

| Sr. No. | Name of Course | Credit |
|---|---|---|
| 1 | UNIT: 1<br>BIOSTATISTICS AND COMPUTER APPLICATION | 3+1 |
| 2 | UNIT-2<br>PRINCIPLES OF ANIMAL AND POPULATION GENETICS | |
| 3 | UNIT-3<br>PRINCIPLES OF ANIMAL BREEDING | |

**Master Degree Programme**

| Sr. No. | CODE | COURSE TITLE | CREDITS |
|---|---|---|---|
| 1. | AGB 601 | ANIMAL CYTOGENETICS AND IMMUNOGENETICS | 2+1 |
| 2. | AGB 602 | MOLECULAR GENETICS IN ANIMAL BREEDING | 2+1 |
| 3. | AGB 603 | POPULATION AND QUANTITATIVE GENETICS IN ANIMAL BREEDDING | 2+1 |
| 4. | AGB 604 | SELECTION METHODS AND BREEDING SYSTEMS | 3+1 |
| 5. | AGB 605 | BIOMETRICAL TECHNIQUES IN ANIMAL BREEDING | 3+1 |
| 6. | AGB 606 | CONSERVATION OF ANIMAL GENETIC RESOURCES | 2+0 |
| 7. | AGB 607 | CATTLE AND BUFFALO BREEDING | 2+1 |
| 8. | AGB 608 | SMALL FARM ANIMAL BREEDING (SHEEP, GOAT, SWINE AND RABBIT) | 2+0 |
| 9. | AGB 609 | POULTRY BREEDING | 2+1 |
| 10. | AGB 610 | LABORATORY ANIMAL BREEDING | 1+0 |
| 11. | AGB 691 | MASTER'S SEMINAR | 1+0 |
| 12. | AGB 699 | MASTER'S RESEARCH | 20 |

**Ph.D. Programme**

| Sr. No. | CODE | COURSE TITLE | CREDITS |
|---|---|---|---|
| 1. | AGB 701 | RECENT ADVANCES IN ANIMAL GENETICS | 2+0 |
| 2. | AGB 702 | RECENT TRENDS IN ANIMAL BREEDING | 2+0 |
| 3. | AGB 703 | ADVANCES IN BIOMETRICAL GENETICS | 2+1 |
| 4. | AGB 704 | ADVANCES IN SELECTION METHODOLOGY | 2+1 |
| 5. | AGB 705 | BIOINFORMATICS IN ANIMAL GENETICS AND BREEDING | 2+0 |
| 6. | AGB 706 | ADVANCES IN MOLECULAR CYTOGENETICS | 2+0 |

| | | | |
|---|---|---|---|
| 7. | AGB 707 | UTILISATION OF NON ADDITIVE GENETIC VARIANCE IN FARM ANIMALS | 2+1 |
| 8. | AGB 791 | DOCTORAL SEMINAR I | 1+0 |
| 9. | AGB 792 | DOCTORAL SEMINAR II | 1+0 |
| 10. | AGB 799 | DOCTORAL RESEARCH | 45 |

## :: CONTACT US ::

**Professor & Head**

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