

**Department of Animal Nutrition,
Vanbandhu College of Veterinary Science & Animal Husbandry,
Navsari Agricultural University, Navsari-396450**

Activities / Achievements

Animal nutrition discipline focuses on the nutritional needs of wild and domesticated animals, primarily those in agriculture and food production. Department of Animal Nutrition of this college has been continuously working for the betterment of animal population through its various activities, including teaching, research and extension. The Department is well equipped with all the modern facilities and instruments to carry out quality research and teaching.

1) Teaching:

Currently Department is offering undergraduate and post graduate courses as per the latest prescribed programs of Veterinary Council of India (2016) and Indian council of Agricultural Research as given below:

i) Undergraduate

| Unit No. | Unit Title | Credit Hrs. |
|----------|--|-------------|
| Unit 1 | Principles of Animal Nutrition and Feed Technology | 3+1 |
| Unit 2 | Applied Ruminant Nutrition-I | |
| Unit 3 | Applied Ruminant Nutrition-II | |
| Unit 4 | Applied Non-Ruminant Nutrition | |

ii) Post graduate

| Course No. | Course Title | Credit Hrs. |
|------------|---|-------------|
| ANN-601 | Animal nutrition-energy and protein | 3+0 |
| ANN-602 | Animal nutrition-minerals, vitamins and feed additives | 3+1 |
| ANN-603 | Feed technology | 1+1 |
| ANN-604 | Feed conservation, storage and quality control | 2+2 |
| ANN-605 | Ruminant nutrition | 2+1 |
| ANN-606 | Non-ruminant nutrition | 1+1 |
| ANN-607 | Nutrition of companion/laboratory, wild and zoo animals | 2+1 |

| | | |
|---------|--|-----|
| ANN-608 | Research techniques in animal nutrition | 1+3 |
| ANN-609 | Non conventional feed stuff and toxic constituents/ anti-metabolites in animal feedstuff | 2+1 |
| ANN-691 | Master's seminar | 1+0 |
| ANN-699 | Master's research | 20 |
| | | |
| ANN-701 | Modern concepts of feeding ruminants and forage utilization | 3+0 |
| ANN-702 | Modern concepts of feeding monogastric animals | 2+0 |
| ANN-703 | Nutrition and rumen fermentation | 1+1 |
| ANN-704 | Advances in micronutrients | 1+0 |
| ANN-705 | Advanced techniques in nutrition and research | 1+2 |
| ANN-706 | Advances in feed technology | 1+1 |
| ANN-707 | Clinical nutrition | 1+1 |
| ANN-708 | Nutrient and drug interaction | 2+0 |
| ANN-709 | New feed resources and toxicants in animal feeding | 2+0 |
| ANN-791 | Doctoral seminar I | 1+0 |
| ANN-792 | Doctoral seminar II | 1+0 |
| ANN-799 | Doctoral research | 45 |

2) Research:

The Department is involved in development of feeding strategies for different categories of ruminants and poultry. The research program main encompasses:

- Evaluation of novel non conventional locally available feed resources
- Use of agro-industrial byproducts for scarcity feeding.
- Application, impact and validation of various feed additives on the productive performance of different classes of livestock and poultry.
- Rumen manipulation through dietary means.
- Application of plant secondary metabolites to augment animal production and health.
- Application of bypass nutrient technology for ruminants.
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List of Research projects

| S.No. | Project Title | Investigators (Core faculty) |
|------------------------------------|--|---|
| Completed research projects | | |
| 1. | Evaluation of feeding and managerial practices of pet dogs in parts of South Gujarat region | PI: Dr. V. R. Patel Co-PI: Dr. M. Choubey, Dr. K. B. Kore, Dr. S. G. Vohra, Dr. D. D. Garg and others. |
| 2. | Effect of dietary supplementation of bypass protein on growth and reproductive performance in buffalo heifers | PI: Dr. S. G. Vohra Co-PI: Dr. V. R. Patel, D. D. Garg and others. |
| 3. | Studies on supplementation of herbal feed additives on growth performance and gut microbial health of broilers | PI: Dr. S. G. Vohra Co-PI: Dr. V.R. Patel, D. D. Garg and others. |
| 4. | Evaluation of phytogenic feed additive supplementation on growth performance, nutrient utilization, anti-oxidants and health status of Surti kids. | PI: Dr. M. Choubey Co-PI: Dr. V. R. Patel and others. |
| 5. | In vitro evaluation of different level of moisture and urea treated sugarcane baggase. | PI: Dr. V. R. Patel Co-PI: Dr. M. Choubey and others. |
| 6. | Economics of growth performance due to dietary inclusion of tanniferous leaves in kids infested with gastrointestinal helminthes. | PI: Dr. M. Choubey Co-PI: Dr. V. R. Patel and others. |
| 7. | Effect of bypass fat supplementation on production performance and economics on lactating buffalo | PI: Dr. A. P. Raval Co-PI: Dr. V. R. Patel, Dr. M. Choubey and others. |
| 8. | Effect of supplementation of yeast on average daily growth, feed conversion ratio and cost economics in Surti goat kids. | PI: Dr. S. Pradhan Co-PI: Dr. V. R. Patel, Dr. M. Choubey and others. |
| On going Research projects | | |
| 8. | Effect of fenugreek (<i>Trigonella foenum-</i> | PI: Dr. M. Choubey |

| | | |
|----|---|--|
| | <i>graecum L.</i>) supplementation on milk yield and quality in lactating Surti buffaloes. | Co-PI: Dr. V. R. Patel and others. |
| 9. | Effect of feeding processed starch on fattening body weight of male Surti kids | PI: Dr. M. Choubey Co-PI: Dr. V. R. Patel and others. |

Research Achievements/ Recommendations

| S. No. | Recommendations for Scientific community |
|--------|---|
| 1. | Supplementation of garlic powder @0.5% alone or in combination with fenugreek seed powder @0.5% in ration of broilers for 6 weeks results in 8.5 and 7.5% more body weight, 9.5 and 7.5% less feed conversion ratio (FCR), 41.50 and 31.0% more nitrogen retention, respectively. |
| 2. | Replacement of 50% regular concentrate mixture with concentrate mixture containing formaldehyde treated protein (bypass protein) in the ration of growing Surti buffalo heifers (15-17 months old) for 6 months results in 13% more average daily gain, 15% better Feed Conversion Ratio and animal shows first estrus earlier as compared to animals kept on 100% regular concentrate mixture. |
| 3. | The Surti goat keepers are recommended to supplement garlic bulb (12 gram or 8-10 cloves/day) to the growing kids (5-6 month) for two months to achieve better growth rate and profit. |
| 4. | During fodder scarcity, farmers are recommended to treat 100 kg sugarcane bagasse with 3.5 kg urea in 40 liter of water and ensile it for three weeks to improve its crude protein content and digestibility. |
| 5. | The farmers of South Gujarat are recommended to include daily the fresh leaves of Banyan tree (120g/d) in the diet of Surti kids to control gastrointestinal worm load for better growth rate and income. |
| 6. | Dietary supplementation of bypass fat (calcium salt of palm fatty acid) @ 0.75 % of dry matter intake from 15 days pre-partum to 90 days post-partum to lactating Surti buffaloes (2-4 lactations) improves milk fat percentage (13%), feed efficiency in terms of FCM (29.24%) and serum triglyceride and cholesterol levels without affecting body condition score. |
| | Recommendations for Farmer's community |
| 1. | A[M.,;"GF BMZFSDF\ _P5@ ;,6GM 5FJ0Z pD[ZJFYL & V9JFI0IFGL p\DZ[T[DGF JHGDF\ s(P5@f GM\W5F+ JWFZM YJFY JW] J/TZ D/[K[P |
| 2. | N1FL6 U]HZFTGF 5X]5F,SMG[E,FD6 SZJFDF\ VFJ[K[S[OST S5FI;IF BM/G[AN,[5_@ ;FN] ;DTM, NF6 VG[5_@ AFI5F; 5 M8LG sOMDF"<0LCF.0 p5RFZLTf JF/] ;DTM, NF6 s!5 YL !* DICGFGLf pKZTL ;]ZTL 5F0LIMG[& DF; ;]WL VF5JFYL ;Z[ZFX ZMHL\NF JHGDF\ !*@ H[8,M JWFZM YFI K[VG[!#@ H[8,M BR" 5 IT ISPU FP XFIZZLS JHG JWFZF NL9 38[K[P |
| 3. | ;]ZTL ASZF5F,SMG[E,FD6 SZJFDF\ VFJ[K[S[5F\R YL K DCLGFGF\ ,JFZVMG[5]ZS VFCEZ TZLS[;,6 s!Z U TM FD VYJF (YL !_ S/Lq NGf A[DCLGF ;]WL BJ0FJJFYL XFIZZLS J'lwW NZDF\ VG[VFJSDF\ JWFZM YFI K[P |
| 4. | 5 TM IT !__ SLU TM F X[Z0LGL AUF;G[#P5 SLU TM F I]ZLIF VG[\$ _ 1,8Z 5F6L £FZF 5 TM IS TM IF VF5LG[+6 V9JF0LIF ;]WL R]:T ZLT[A\W ZFBJFYL T[GF G+L, |

| | |
|----|--|
| | 5NFYM"DF\ VG[5FrITFDF\ JWFZM YFI K[P VFYL 3F;RFZFGL VKTGF ;DIDF\ 5X]5F,SMG[T[GL E,FD6 SZJFDF\ VFJ[K[P |
| 5. | N11F6 U]HZFT GF ASZF5F,SMG[E,FD6 SZJFDF\ VFJ[K[S[,JFZFVMG[J0GF J'1FGF TFHF 5FG s!Z_ U TM FDq NJ;f BZFFJFYL 5FRGT\+GF S'ID G] EFZ6 IGI\+T YFI K[VG[J'lwW T[DH VFJS JW[K[P |
| 6. | દલિણ ગુજરાતના પશુપાલિકોને ભિમણ કરવામાં આવે છે કે સૂરતી ભેંસને મવયાણના આશરે ૧૫ ફેવસ પહેલિાથી અને મવયાણ બાદના ૯૦ ફેવસ સુધી પૂરક આહાર તરીકે બાયપાસ િેટ ૧૦૦ ગ્રામ/ફેવસ આપવાથી દૂધમાં િેટની ટકાવારી અને નિાનું પ્રમાણ વધે છે. |

Post graduate students (up to 2015-16):

| P.G. Studies | Completed | Perusing |
|--------------|-----------|----------|
| M.V.Sc. | 04 | 01 |
| Ph.D. | -- | 01 |

Thrust Area of research

- By Pass Nutrient
- Plant secondary metabolites
- Methane mitigation
- Herbal feed additives
- Non Conventional feeds
- Total Mixed Ration
- Clinical Nutrition

3) Extension:

The departmental faculty is actively involved in various extension activities as given below:

- Nutritional analysis of feed and fodder for farmers and industry.
 - Krushimahotsavs being organized by Govt. of Gujarat.
 - Pashupalan Shibirs organized by District Panchayat, Co-operatives or KVKs.
 - Various trainings organized by State Animal Husbandary Department.
 - Advice to farmers and entrepreneurs.
 - Training courses for field veterinarians, extension workers and farmers.
 - Sports and NSS activities.
- Department has also successfully organized a Model training Course on "Precision Nutrition: A Tool for Sustainable Dairy Production" from 4-11 September, 2014 for the officers from ICAR institutes/SAUs/KVKs/ State Animal

Husbandry department etc. This course was sponsored by Directorate of Extension, Ministry of Agricultural, Govt. of India, New Delhi.

4) Other Information:

Department is well equipped and operational with all the modern facilities to carryout quality research and teaching related to the nutritional studies. Some of the facilities and equipments available are depicting below:

Facilities

- Feed preparation (grinding and mixing)
- Proximate and mineral analysis of feed, fodder, faeces, urine and other biological samples.
- *In vitro* evaluation of feed and fodder for their nutritional worth.
- *In vivo* evaluation (metabolism trial) of feed and fodder for their nutritional worth.
- Analysis of rumen metabolites
- Blood metabolic profile test
- Hormone assay in biological fluids (ELISA based)

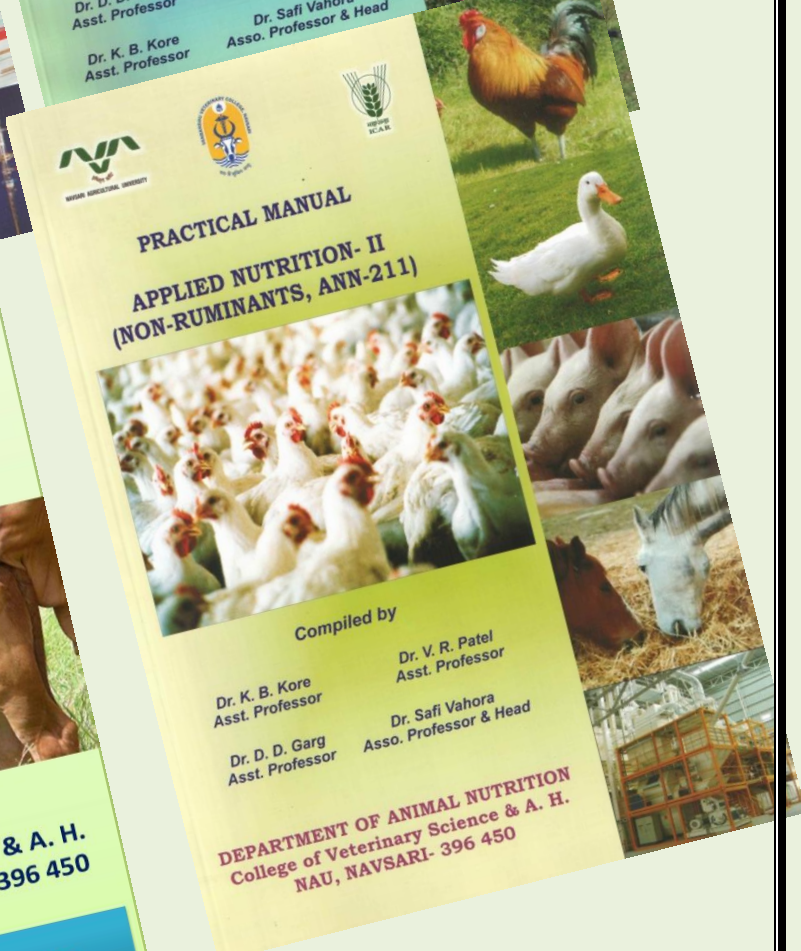
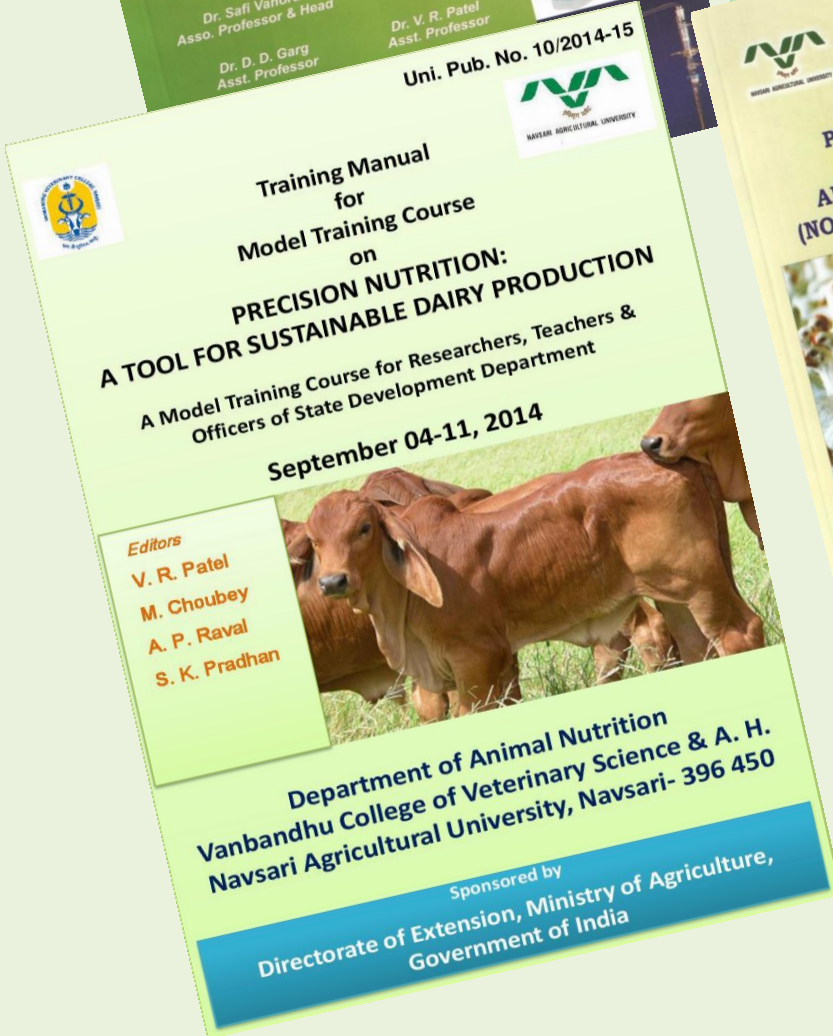
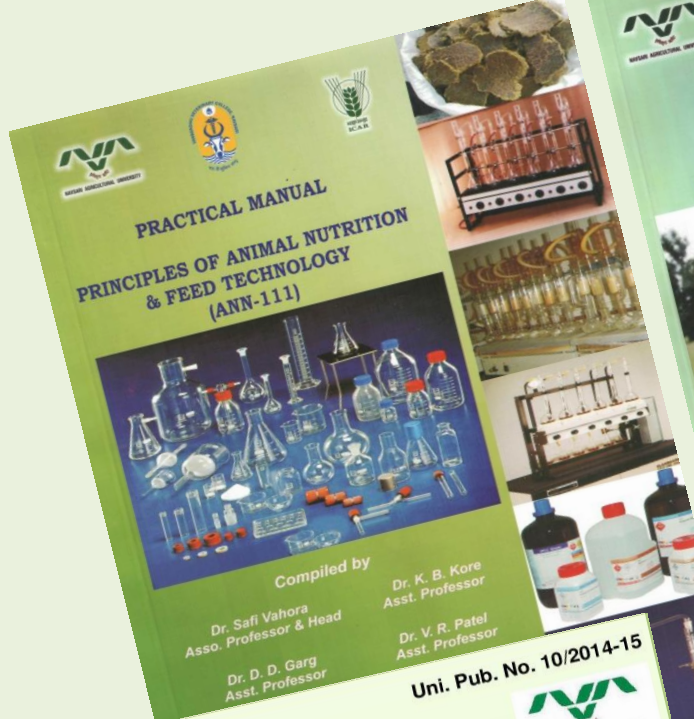
Equipments

- Hot air oven
- Muffle furnace
- Soxhlet apparatus
- Kjeldahl assembly
- Water bath
- Digital metabolic shaker bath
- Large animal weighing balance
- Bomb colorimeter
- B.o.d. Incubator
- pH meter
- Thermal cycler
- Gel Doc XR+
- Refrigerated centrifuge
- Flame photometer
- Autoclave
- Visible and UV spectrophotometer
- Ultrasonic processor
- Vacuum Oven
- Elisa washer and reader
- Anaerobic work station
- Dry block heater
- Micro pulsar electroporater
- Crude fiber estimation
- KEL PLUS
- SOCS PLUS
- PCR workstation
- Small animal metabolic cages
- Large animal metabolic cages

Publications

- 1) K.K. Sorathiya, M. Choubey, V.R. Patel, Safi G. Vahora, D.D. Garg, M.D. Jadhav And P.M. Tabhani (2015) Effect of feeding formaldehyde treated protein on nutrient utilization and economics in Surti buffalo heifers. *Indian Journal of Animal Sciences*. **85**: 1393-1395. **(NAAS rating: 6.00)**
- 2) V.R. Patel, M. Choubey, D.D. Garg and Safi Vahora (2014) Comparative *in vitro* evaluation of three strains of rice straw for ruminant feeding. *Indian Veterinary Journal*. **91**: 81-85. **(NAAS- rating: 4.33)**
- 3) R.M. Patel, D.D. Garg, V.R. Patel, S.G. Vahora, M.A. Katariya, M. Choubey (2014) Effect of dietary supplementation of garlic (*Allium sativum*) and fenugreek (*Trigonella foenum-graecum* L.) seed powder on growth performance and blood biochemical parameters in broilers. *Indian Journal of Poultry Science*. **49**: 17-20. **(NAAS rating: 5.01)**
- 4) V.R. Patel, R.S. Gupta and V.R. Jani. (2012) Effect of feeding bypass protein on growth, body measurements and nutrient utilization in growing buffalo heifers: A field trial. *Indian Journal of Animal Nutrition*. **29**: 152-156. **(NAAS rating: 4.67)**
- 5) **V. R. Patel**, R.S. Gupta, S. Parnerkar, V.R. Jani and D.D. Garg (2012) performance of buffalo heifers fed on bypass protein: An on-farm appraisal. *Animal Nutrition and Feed Technology*. **12**: 395-402. **(NAAS rating: 6.37)**
- 6) Mahipal Choubey, Ashok Kumar Pattanaik, Shalini Baliyan, Narayan Dutta, Sunil E Jadhav and Kusumakar Sharma (2014) Dietary supplementation of a novel phytogetic feed additive: effects on nutrient metabolism, antioxidant status and immune response of goats. *Animal Production Science*. Published online: 9 July 2015 (<http://dx.doi.org/10.1071/AN14770>). **(NAAS-rating: 7.22)**
- 7) M. Choubey, A.K. Pattanaik, S. Baliyan, Ajit Kumar, Avneesh Kumar, Narayan Dutta, S.E. Jadhav and K. Sharma (2014) Effect of a composite phytochemical feed additive on *in vitro* substrate degradation and methanogenesis and *in vivo* rumen fermentation. *Animal Nutrition and Feed Technology*. **14**: 523-534. **(NAAS rating: 6.36)**
- 8) M Choubey, M Wadhwa, MPS Bakshi (2015) Evaluation of urea molasses multi-nutrient blocks containing alternate feed resources in buffaloes. *Buffalo Bulletin*. **34**, 5-9. **(NAAS rating: 7.09)**
- 9) A. Das, M. Choubey, S.P. Gupta, M. Saini and D. Swarup. (2010) Feed consumption, nutrient utilization, faecal pellet characteristics and serum metabolite profile of captive spotted deer (*Axis axis*) fed diets containing different roughages. *Small Ruminant Research*. **94**: 185–189. **(NAAS rating: 7.12)**
- 10) A. Das, S. Katole, M. Choubey, S. P. Gupta, M. Saini, V. Kumar and D. Swarup (2013) Feed consumption, diet digestibility and mineral utilization in captive blackbuck (*Antelope cervicapra*) fed different levels of concentrates. *Journal of Animal Physiology and Animal Nutrition*. **97**: 80–90. **(NAAS rating: 7.25)**

Manuals published



Department of Animal Nutrition, NAU, Navsari

Departmental snaps

