

DEPARTMENT OF ANIMAL GENETICS AND BREEDING

1. INTRODUCTION

The Department of Animal Genetics and Breeding (earlier Department of Animal Breeding, Genetics and Biostatistics and renamed as Department of Animal Genetics and Breeding from Jan, 2011) came in to existence as an independent department on July 1, 1991 with the division of then Department of Animal Production created in 1986 along with the establishment of College of Veterinary and Animal Sciences. Till then, the activities concerning Animal Genetics and Breeding especially teaching, research and extension on genetic improvement of livestock resources were being carried under Department of Animal Production, COVAS from 1986 and under Department of Animal Sciences, COA from 1975. Since inception, the department is actively engaged in teaching, research and extension education in specialization in Animal Genetics and Breeding. Apart from undergraduate teaching, the department has postgraduate and Ph.D. programmes leading to M.V.Sc. and Ph. D. degrees in Animal Genetics and Breeding since 1981. Till date, the department has produced 27 M.Sc. /M.V.Sc. and 5 Ph.D. in Animal Genetics and Breeding.

The department is actively involved in need-based research in priority areas for genetic improvement of existing livestock resources among cattle, sheep, goat, horses and poultry in the state and to formulate appropriate breeding strategies for their genetic improvement. The major research achievements have been genetic evaluation of exotic and crossbred germplasm of different domesticated livestock species (cattle, goat, sheep, Angora rabbit, broiler rabbits, poultry etc.), performance evaluation of crossbred /graded cows under field conditions, field based genetic improvement programmes using farmer's flocks in sheep and goats, morphological, genetic, behavioural and physiological studies on Red Jungle Fowls and undertake their captive breeding and dissemination of production technologies in Poultry etc. Recently department has developed location specific rural poultry variety named "Himsamridhi" suitable to local agro-climatic conditions and hill farming system. During recent years, the research had focused on characterization and conservation of unique but dwindling animal genetic resources of the state including Himachali Pahari cattle, Gaddi sheep and goats, Rampur-bushair sheep, Chegu goats, Spiti horses, native fowls and Red Jungle fowls and undertaking in- situ and ex-situ breed conservation programmes for threatened and endangered breeds like Tegu goats, Spiti/Chamurthi horses. Registration of non- descript hill cattle of Himachal Pradesh as distinct recognized indigenous cattle breed of India by the name Himachali Pahari (Accession No. INDIA CATTLE 0600 HIMACHALI PAHARI 03049) by ICAR breed registration committee was another significant achievement of the department after compilation of research data, preparation and submission of proposal to NBAGR, Karnal in collaboration with Deptt. of AH, Himachal Pradesh approval by the GoI and its gazette notification. Till date, the department has successfully completed 12 externally funded projects sponsored by different funding agencies, with total financial outlay of Rs.189.16 lacs. Presently, two ICAR funded AICRP's on Poultry Breeding (Rural Poultry Unit) and Goat improvement (Gaddi Field Unit) and one DST funded Immunocompetence status and Genetic diversity in MHC region of Multifarious endangered Chegu goat of temperate Himalayan region are operational in the department.

2. TEACHING

a) Undergraduates Courses:

S. No.	Course No.	Course Title	Cr. Hrs.	Name of Teacher(s)
1st Semester				
1.	AGB	Animal Genetics and Breeding	3+1	Dr. Varun Sankhyan Dr. Krishanender Dinesh Dr. Rajesh Kumar Dr. Nishant Verma
2nd Semester				
1.	AGB	Animal Genetics and Breeding	3+1	Dr. Varun Sankhyan Dr. Krishanender Dinesh Dr. Rajesh Kumar Dr. Nishant Verma

b) Postgraduate Courses:

S. No.	Course No.	Course Title	Cr. Hrs.	Name of Teacher(s)
M.V. Sc. Courses (1st Semester)				
1.	AGB 601	Animal Cytogenetics and Immunogenetics I	2+1	Dr. Varun Sankhyan Dr. Nishant Verma
2.	AGB 603	Population and Quantitative Genetics	2+1	Dr. Varun Sankhyan Dr. Rajesh Kumar
3.	AGB 604	Selection Method and Breeding System	2+1	Dr. Varun Sankhyan Dr. Krishanender Dinesh
4.	AGB 605	Biometrical Genetics I	2+1	Dr. Krishanender Dinesh Dr. Rajesh Kumar
M.V. Sc. Courses (2nd Semester)				
1.				
2.				
3.				
4.				
5.				
Ph. D. Courses (1st Semester)				
1.				
2.				
Ph. D. Courses (2nd Semester)				
1.				
2.				

c) Numbers of students graduated (Please give data about foreign nationals in footnotes):

Degree	During last academic year	Accumulated total
M.V. Sc.	Nil	27
Ph.D.	Nil	5

d) National and International Level Competition: UG/MSc/PhD: Nil

Competition	No. of students qualified	No. of students appeared	% age of qualified	Distinguished rank, if any
ICAR-JRF				

SRF				
ASRB				
ARS				
NET				
ICAR NET				
UGC NET				
CSIR NET				
GRE/TOEFL				

e) Student got admission in National and International institutes: Nil

Department	Name of the student with admission No.	Name of Advisor	Institute of Admission	Programme of study

f) Student got job/placement in India or abroad: Nil

Department	Name of the Student with Admission No.	Name of Advisor	Nature of Job/Designation	Organization

3. RESEARCH

a. Postgraduate Research

i) Ongoing Masters Programme:

S. No.	Name of the student	Admission No.	Major advisor	Title of Research Problem
1.	Nidhi Daroch	V-2022-30-001	Dr. Varun Sankhyan	Identification of Genetic Polymorphism in Candidate Genes related to Egg Production and Egg Quality traits in Native Chicken of Himachal Pradesh

ii) Ongoing Doctoral Programme: Nil

S. No.	Name of the student	Admission No.	Major advisor	Title of Research Problem
1.				
2.				

iii) Postgraduate Research Salient Achievements

S. No.	Title of Research problem	Salient Research Achievements
1.		
2.		
3.		

b. Research Projects in Progress: 4

S. No.	Title of Project	PI	Funding Agency	Budget (Lacs)	Year of start	Duration
1.	AICRP on Poultry Breeding (Rural Poultry Unit)	Dr. Varun Sankhyan	ICAR, DPR Hyderabad	89.86	2009	Ongoing
2.	AICRP on Goat Improvement (Gaddi Field Unit)	Dr. Nishant Verma	ICAR, CIRG, Makhdoom	19.07	2010	Ongoing
3.	En route Improvement of Migratory Sheep and Goat Husbandry through Technological and Physical Intervention	Dr. Varun Sankhyan	RKVY	10.00	2022	One Year
4.	Immunocompetence Status and Genetic Diversity in MHC Region of Multifarious Endangered Chegu Goat of Temperate Himalayan Region	Dr. Rajesh Kumar	DST	48.91	2022	3Year

c. Summary of research finding during the year

- During 2022-2023, Dahlem Red (DR), Native/ *Desi*, *Himsamridhi* and DRXN cross poultry stocks were evaluated on farm for different performance traits. The Dahlem Red birds had shown better performance for body weight, age at sexual maturity and egg production.
- A total of 53848 chicks of different stocks (*Himsamridhi* 40472, Dahlem Red (DR) 2247, Native (N) 9058 and DN 2071) were hatched from fertile eggs. The overall fertility was 87.98 % and % hatchability on TES and FES basis were 68.94% and 78.36% respectively.
- 50682 chicks of different stocks were supplied to 573 farmers to establish poultry units. 81 backyard poultry units with 4050 chicks were established in tribal areas (TSP component of AICRP Poultry) and provided free inputs (chicks, feed, medicines etc.)
- The egg production at Poultry Farm was 185982. Out of this, 107877 eggs were sold as table eggs and 78105 eggs were used for hatching of chick
- The department is maintaining a selected improved Native / *Desi* bird population with G₁₀ generation of the stock now under evaluation. The *Native/ Desi* birds had shown continual improvement for growth and production traits over generation
- Migratory goat flocks of 31 farmers, 8 of which are in complete transhumance system of production were registered for scientific interventions. The total strength of the flock was 1716. A total of 636 young kids were added by way of birth and 557 animals pertaining to different age groups were sold.
- The least square means during the year under report for body weights at birth, 3 month, 6 month, 9 month and 12 months of age were 3.13±0.06, 16.12±0.19, 21.92±0.21, 25.82±0.12 and 29.62±0.18 Kg respectively.
- For breeding inputs, a total of 12 male kids of 4-6 months age group were purchased from farmer's flocks after primary selection on the basis of morphological characteristics and better/ higher growth rates. These male kids were then transferred to Palampur center for subsequent rearing up to the age of sexual maturity, following all standard management practices.
- All selected animals were provided health coverage under migratory field conditions viz. vaccination against PPR, FMD (4192), de-worming against endo-parasites after faecal

sample analysis (2096 animals), periodic health check-ups etc. Strategic supplementary feeding was also provided in the form of concentrate feed (11qtls.).

- The overall population growth was observed to be 100.9%. The overall mortality incidence was found to be 6.41%. The incidence of twin birth recorded was 15.41%. The overall abortion incidence in the flocks was observed to be 6.22%.

d. Establishment of research collaboration with national and international institutes: Nil

S. No.	Name of collaborating institute and country	Nature of collaborations	Collaborating person(s) at both institutes

e. Scientific Publications and Presentations (as per standard format)

i) Publications: 3

1. Dinesh K, Sankhyan V, Thakur D, Kumar R, Bhardwaj N and Katoch S. (2023). Effect of Genotype and Season on Fertility and Hatchability of Eggs in Dahlem Red, Native and DND Chicken under Intensive System in Himachal Pradesh. Indian Journal of Animal Sciences 93(5):460-463. (NAAS 6.29)
2. Sankhyan V, Thakur R, Dogra PK and Thakur A (2022). Phenotypic characterization and documentation of Gaddi dog of western Himalayan region of India. Indian Journal of Animal Sciences 92(10): 1189-93. (NAAS 6.29)
3. Dinesh K, Sankhyan V, Thakur D, Kumar R and Thakur YP (2023). Performance Evaluation of Dahlem Red, Rhode Island Red and Native Chicken under Intensive Management in Himachal Pradesh. The Haryana Veterinarian (Accepted for publication). (NAAS 5.58)

ii). Presentations

1. Varun Sankhyan and Ravindra Kumar (2023) Contribution of livestock in natural and organic farming for sustainability of Agri-Livestock food system. Compendium of National Conference on 'Natural & Organic Farming for Ecological, Economical & Nutritional Security': Page No: 99-104.

iii). Manuals, Books, Booklets and Bulletin:

1. Practical Manual Principle of Animal and Population Genetics (unit II) prepared for UG teaching as per VCI-2016 syllabus

f. Technologies or patent Developed /Registered/Research infrastructure developed

S. No	Technology/infrastructure	Significance	Scientist(s) involved
1	Installation of Cages at Poultry Farm	Housing of layer birds	All faculty members
2	Construction of Poultry lab	Estimation of egg quality parameters	All faculty members

4. EXTENSION

a. Extension Publication

1. कृष्णेंद्र दिनेश और वरूण संख्यान (July,2022). युवाओं के लिए रोजगार का बेहतर स्रोत: बतख पालन। गिरिराज साप्ताहिक 13-19 July,2022.
2. कृष्णेंद्र दिनेश और वरूण संख्यान (August,2022). पोल्ट्री फार्म में जैव सुरक्षा। गिरिराज साप्ताहिक 24-30 August,2022.
3. कृष्णेंद्र दिनेश और देवश ठाकुर (October,2022). पशु आनुवांशिकी सुधार का सरल उपाय कृत्रिम गर्भाधान। गिरिराज साप्ताहिक 19-25 October,2022
4. कृष्णेंद्र दिनेश, वरूण संख्यान एवं देवेश ठाकुर (2022). हिमाचल प्रदेश में बकरी पालन हेतु उपयुक्त बकरी की नस्लें। पशुधन प्रकाश (तेरहवां अंक 2022): 30-31
5. राजेश कुमार, राकेश ठाकुर, वरूण संख्यान, कृष्णेंद्र दिनेश और शिवानी कटोच (2022). विभिन्न ऋतुओं में कुक्कुट उत्पादन एवं प्रबंधन। पर्वतीय खेतीबाड़ी : 23-26. (जुलाई से सितम्बर 2022)

b. Radio talk/ TV Telecast: 1

1. Live TV programme on DD Himachal on Backyard Poultry Farming dated 27.3.2023 by Dr. Krishanender Dinesh

c. Clinical camps/trainings/extension camps/animal health camps

S. No.	Particulars	Number	Participant		Remarks
			Male	Female	
1.	Training conducted				
2.	Farmers training (i) On-campus (ii) Off-campus	5	70	130	
3.	Training to Extension Officials				
4.	Campus organized				
5.	Farmers attended	120	50	70	Exposure visit to poultry farm
6.	Field Days				
7.	OFTs				
8.	Bulletins, pamphlets developed				
9.	Animals disease outbreaks				
10.	Others, if any				

d. Clinical cases (routine and referrals)/disease investigations/disease outbreaks investigated

S. No.	Types of affection/disease/samples/condition	Specie wise numbers							Important findings and remarks
		Bovine	Canine	Feline	Equines	Avian	Wild life	Human	
	Total								

5. PARTICIPATION IN WORKSHOP/ CONFERENCES, TRAININGS ETC.

a) Trainings:

S. No.	Date	Title	Name of Participants
1.	August 22-27, 2022	Induction training programme for newly recruited faculty of CSKHPKV	Dr. Krishanender Dinesh
2.	August 22-27, 2022	Induction training programme for newly recruited faculty of CSKHPKV	Dr. Rajesh Kumar
3.	November 3-8, 2022	Analysis of Multi Environment Trials, ICAR NAARM Hyderabad	Dr. Varun Sankhyan

b) Conferences/workshops/seminars/symposia:

S. No.	Date	Title	Name of Participants	Nature of participation
1.	September 8-9, 2022	Review meeting of AICRP on Poultry Breeding and Poultry Seed Project at College of Veterinary Sciences, SVVU Tirupati	Dr. Varun Sankhyan	Presentation of Report
2.	April 27-28, 2023	Krishi Vigyan mein Takniki Shabdavali ka Upyog evam Mahtav	Dr. Varun Sankhyan	Participated
3.	April 27-28, 2023	Krishi Vigyan mein Takniki Shabdavali ka Upyog evam Mahtav	Dr. Krishanender Dinesh	Participated
4.	April 27-28, 2023	Krishi Vigyan mein Takniki Shabdavali ka Upyog evam Mahtav	Dr. Rajesh Kumar	Participated
5.	June 7-9, 2023	National Conference on Natural and Organic Farming for Ecological, economical and Nutritional security organized by Organic Agricultural Society of India (OASI) at CSKHPKV Palampur	Dr. Varun Sankhyan	Lead paper presentation

6. INCOME GENERATED BY COMMERCIAL UNITS AND SERVICE WINDOWS

S. No.	Name of product/service	Person(s) associated	Income generated annually (Rs)
1	Poultry revolving fund scheme	Dr Varun Sankhyan Dr Krishanender Dinesh	25,37,015.0

8. EXTRA CURRICULUM DUTY: NCC/NSS/HOSTEL WARDEN/SPORTS ETC.

Name of teacher	Nature of duty	Period	Distinguished achievement, if any
Dr. Varun Sankhyan	Class In charge (2 nd year)	2018 onwards	
Dr. Krishanender Dinesh	NSS Co incharge	September 2021 onwards	

ANNEXURES

Annexure – I (Faculty position, including names of superannuated persons with asterisk)

S. No.	Name	Designation
1.	Dr. Shivani Katoch	Professor & Head
2.	Dr. Varun Sankhyan	Assistant Professor
3.	Dr. Krishanender Dinesh	Assistant Professor,
4.	Dr. Rajesh Kumar	Assistant Professor

Annexure – II (Staff Position)

S. No.	Name	Designation
1.	Sh. Vijay Kumar	Senior Assistant
2.	Sh. Abhishek	Lab Attendant
3.	Sh. Suresh	Veterinary Pharmacist
4.	Sh. Roshan Lal	Beldar
5.	Smt. Pushpa Devi	Sweeper

Annexure –III (Budget)

S. No.	Scheme	Salaries	TA	Contingency	TOTAL
1.	Teaching facilities in department of AG & Breed. (SCP-001-43)	106252			106252
2.	Est. of Poultry Res. Lab. (SCP-002-43)	2173373			2173373
3.	Facilities for Res. On Angora rabbits. (SCP-003-43)	467518			467518
4.	Strengthening of teaching departments in COVAS. (SCP-011-43)	771447			771447
Externally Funded Scheme (In lacs)					
5.	AICRP on Poultry Breeding (Rural Poultry Unit); ICAR-045-73	3820279	132689	3063710	7016678
6.	AICRP on Goat Improvement; ICAR-046-43	---	---	2247840	2247840