



**Department of Animal Husbandry and
Dairy Science
Post Graduate Institute
Mahatma Phule Krishi Vidyapeeth,
Rahuri-413 722, Dist. Ahmednagar (MS)**



Preamble

The department of Animal Husbandry and Dairy Science is established in 1968 as one of the constituent department of the Mahatma Phule Krishi Vidyapeeth, Rahuri. The activities of the department are mainly teaching, research and extension in the jurisdiction of the University.

Teaching evolves post-graduate programme in Animal Husbandry and Dairy Science disciplines since the inception of the department. Ph D. was started in function in both the disciplines in 1995. At present, the intake capacity for M. Sc. is 16 students and 8 students for Ph.D programme.

The on going research projects under the department are cattle, buffalo, sheep and goat and the extension of the technologies/interventions / recommendation are widely percolated to the farmers. Priority areas and need base / location specific experiments are also carried out in addition to mandatory programme.

Mandates

- To offer courses for M.Sc. (Agri.) and Ph. D in Animal Husbandry and Dairy Science
- To undertake basic, strategic applied research programmes through post graduate students in the department.
- Livestock improvement programme for sustainable Dairy farming.
- Conventions of seminars, symposia and conferences for exchange of Scientific Information.
- To cater the technological needs with regards to animal husbandry as transfer of advanced technology through demonstrations and published literature.

Faculty

Sr. No.	Name	Designation	Specialization
1	Dr. D. K. Kamble	Professor & I/c Head	Dairy Science/Technology
2	Dr. S.D.Mandakmale	Associate Professor	Animal Breeding
3	Dr. V.E. Narwade	Associate Professor	Veterinary Surgery
4	Dr. V.S.Lawar	Associate Professor	Animal Breeding

5	Dr. R.J.Desale	Associate Professor	Dairy Science
6	Dr. Y.B. Kandalkar	Assistant Professor	Animal Breeding
7	Dr. R.G. Nimse	Assistant Professor	Veterinary Science
8	Dr. P.S. Sakhare	Assistant Professor	Veterinary Science
9	Dr. A.R. Deshmukh	Associate Professor	Dairy Science
10	Dr.S.B.Adangale	Assistant Professor	Animal Nutrition

Academic Programmes

Annual Intake Capacity of P.G. Students

Sr. No.	Degree Programme	Location	Discipline		Total
			Animal Husbandry	Dairy Science	
1.	M.Sc. (Agri)	PGI, Rahuri	9	6	15
		AC, Pune	6	-	6
		A.C. Kolhapur	-	6	6
		A.C. Dhule	4	-	4
2.	Ph.D	PGI, Rahuri	4	4	8
Total			23	16	39

Note: above figures are excluding ICAR quota and in-service candidate

Course Layout Minimum Credit Requirements

M.Sc. (Agri.) Animal Husbandry

Semester	Course Credits					NCCC
	Major	Minor	Supporting	Seminar	Total	
I	9	5	3	-	17	2
II	8	4	3	-	15	2
III	3	-	-	-	3	2
IV	-	-	-	1	1	
Total	20	9	6	1	36	6

M.Sc. (Agri.) Dairy Science

Semester	Course Credits					NCCC
	Major	Minor	Supporting	Seminar	Total	
I	9	6	3	-	18	2
II	9	4	3	-	15	2
III	2	-	-	-	2	2
IV	-	-	-	1	1	
Total	20	9	6	1	36	6

Ph.D. Animal Husbandry

Semester	Course Credits					NCCC
	Major	Minor	Supporting	Seminar	Total	
I	8	4	3	-	15	2
II	7	4	3	-	14	2
III	3	-	-	1	4	2
IV	-	-	-	1	1	-
V	-	-	-	-	-	-
VI	-	-	-	-	-	-
Total	18	8	6	2	34	6

Ph.D. Dairy Science

Semester	Course Credits					NCCC
	Major	Minor	Supporting	Seminar	Total	
I	9	4	3	-	16	2
II	6	4	3	-	13	2
III	3	-	-	1	4	2
IV	-	-	-	1	1	-
V	-	-	-	-	-	-
VI	-	-	-	-	-	-
Total	18	8	6	2	34	6

**Semester wise revised course plan as per ICAR norms for
M.Sc. (Agri.) Animal Husbandry**

Course No.	Title	Credit
Major Courses (20)		
AH -501	Livestock Production and Management	3 = 2 + 1
AH -502	Selection Methods and Breeding Systems	3 = 2 + 1
AH-503	Principles of Animal Nutrition	3 = 2 + 1
AH -504	Animal Behaviour and Integrated Livestock Farming	3 = 2 + 1
AH -505	Physiology of Lactation	2 = 2 +0
AH -506	Population and Quantitative Genetics	3 = 2+1
AH -507	Ruminant Nutrition	3 = 2+1
Minor Courses (9)		
DSC-501	Market Milk Process Technology	3 = 2 + 1
AH-508	Analytical Techniques in Animal Nutrition	2 = 0+2
AH -510	Sheep and Goat Production and Management	2 = 1 + 1
AH-509	Molecular Genetics in Animal Breeding	2 = 1 + 1
Supporting Courses (6)		
STAT-511	Statistical Methods for Applied Science	3 = 2+1
STAT-508	Design of Experiments for Animal Science	3 = 2+1
Or		
MBB -511	Animal Biotechnology	3= 3+0
Compulsory Non-Credit Courses (6)		
PGS-501	Library and Information Services	1=0+1
PGS-504	Basic Concepts In Laboratory Techniques	1=0+1
PGS-502	Technical Writing and Communication Skills	1=0+1
PGS-503	Intellectual Property and its Management in Agriculture	1=0+1
PGS-505(ecourse)	Agriculture Research, Research Ethics and Rural Development Programmes	1 = 1 + 0
PGS-506(e course)	Disaster Management	1 = 1 + 0
Seminar (1)	Seminar	1 =0+1
Research-599 (20)	Research	0+20=20
	Total	55

**Semester wise revised course plan as per ICAR norms for
M. Sc. (Agri.) Dairy Science**

Course No.	Title	Credits
Major courses (20)		
DSC -501	Market Milk Process Technology	3 = 2 + 1
DSC -502	Dairy Processing and product technology	3 = 2 + 1
DSC -504	Chemistry of Milk and Milk Products	3 = 2 + 1
DSC -506	Microbiology of Milk and Milk Products	3 = 2 + 1
DSC -503	Traditional and Value Added Dairy Products	3 = 1 + 2
DSC -507	Dairy Starter and Fermented Milks	2 = 1 + 1
DSC -508	Milk By-Product Technology	1 = 0 + 1
DSC -505	Physico-Chemical Aspect of Milk Constituents and Milk Products	2 = 1 + 1
Minor Courses (9)		
AH-501	Livestock Production and Management	3 = 2 + 1
DSC-510	Quality Control and Sensory Evaluation of Milk and Milk Products	3 = 2 + 1
DSC -509	Packaging for milk and milk products	1 = 0 + 1
AH- 505	Physiology of Lactation	2 = 2 + 0
Supporting Courses (6)		
BIOCHEM-501	Basic Biochemistry	3 =2+1
STAT -508	Design of experiments for Animal Science	3 =2+1
Compulsory Non Credit Courses (6)		
PGS-501	Library and Information services	1 =0+1
PGS-504	Basic concepts in laboratory techniques	1 =0+1
PGS-502	Technical writing and communication skills	1 =0+1
PGS-503	Intellectual property rights and its management in agriculture	1 =0+1
PGS-505(ecourse)	Agriculture Research, Research Ethics and Rural Development Programmes	1 = 1 + 0
PG- 506 (e course)	Disaster Management	1 = 1 + 0
Seminar -591		01
Research		0+20=20
Total		55

**Semester wise revised course plan as per ICAR norms for
Ph. D. Animal Husbandry**

Course No.	Title	Credits
Semester I (15)		
Major Courses (8)		
AH – 601	Advances in Livestock Production and Management	3 = 2 + 1
AH – 602	Advances in Selection Methodology	2 = 1 + 1
AH – 603	Modern Concepts of Feeding Ruminants and Forage Utilization	3 = 2 + 1
Minor Courses (4)		
AH- 607	New feed Resources and Toxicants in Animal Feeding	2 = 2 + 0
AH – 608	Utilization of Non-additive Genetic Variance in Farm Animals	2 = 1 + 1
Supporting Courses (3)		
BIOCHEM-602	Advanced Molecular Biology	3 = 3+0
Compulsory Non Credit Courses		
PGS-501	Library and Information Services	1 =0+1
PGS-504	Basic concepts in laboratory Techniques	1 =0+1
Semester II (14)		
Major Courses (7)		
AH-604	Recent Trends in Animal Breeding	2 = 2 + 0
AH-605	Nutrition and Rumen Fermentation	2 = 1 + 1
AH-606	Advances in Poultry Production	3 = 2 + 1
Minor Courses (4)		
AH - 609	Production of Organic Livestock Products	2 = 1 + 1
AH - 610	Advances in Quality Control of Livestock Products	2 = 2 + 0
Supporting Courses (3)		
STAT-601 OR STAT-604	Advanced Statistical Methods Or Genetical Statistics	3= 2+1 /1+2
Compulsory Non Credit Courses		
PGS-502	Technical writing and communication skills	1 =0+1
PGS-503	Intellectual property rights and its management in agriculture	1 =0+1
Semester III (4)		
Major Courses (3)		
AH- 611	Advances in Sheep and Goat Production	3 = 2+1
Minor Courses (0)		
Seminar –691 (1)	Doctoral Seminar	1=0+1
Supporting courses (0)		
Compulsory Non Credit Courses		

PGS – 505 (e course)	Agriculture Research, Research Ethics and Rural Development Programmes	1 = 1 + 0
PGS – 506 (e course)	Disaster Management	1 = 1 + 0
SEMESTER IV (1)		
Major Courses (0)		
Minor Courses (0)		
Seminar –692 (1)	Doctoral Seminar	1=0+1
Supporting courses (0)		
Compulsory Non Credit Courses		
SEMESTER V		
Major Courses (0)		
Minor Courses (0)		
Supporting courses (0)		
Compulsory Non Credit Courses		
SEMESTER IV		
Major Courses (0)		
Minor Courses (0)		
Supporting courses (0)		
Compulsory Non Credit Courses		
THESES-699		45
	Total	Credits 75

**Revised Course Plan as per ICAR norms for
Ph. D. Dairy Science**

Semester I (16)		
Major Courses (9)		
Course No.	Title	Credits
DSC – 601	Advances in Milk and Milk Products Technology	3 = 2 + 1
DSC – 602	Advances in Dairy Microbiology	3 = 2 + 1
DSC – 603	Advances in Dairy Processing	3 = 2 + 1
Minor Courses (4)		
AH- 601	Advances in Livestock Production and Management	3 = 2 + 1
DSC – 606	Recent Advances in Sensory Evaluation	1 = 1 + 0
Supporting Courses (3)		
FST-611	Advances in Food Biotechnology	3 =2+1
Non Credit Compulsory Courses		
Semester II (13)		
Major Courses (6)		
DSC – 604	Advances in Chemistry of Milk Processing	3 = 2 + 1
DSC – 605	Recent Trends in Value Added Dairy Products	3 = 2 + 1

	and Byproducts	
Minor Courses (4)		
DSC - 607	Advances in Dairy Food Packaging	2 = 1 + 1
AH – 610	Advances in Quality Control of Livestock Products	2 = 2 + 0
Supporting Courses (3)		
STAT-605	Design of experiments for plant sciences	3 = 2+1
Non Credit Compulsory Courses		
PGS-501	Library and information services	1 =0+1
PGS-504	Basic concepts in laboratory techniques	1 =0+1
Semester III (4)		
Major Courses (3)		
DSC- 608	Research and Development Management in Diary Industry	3= 3+0
Minor Courses (0)		
Supporting Courses (0)		
Non Credit Compulsory Courses		
PGS-502	Technical writing and communication skills	1 =0+1
PGS-503	Intellectual property rights and its management in agriculture	1 =0+1
Seminar –691 (1)	Doctoral Seminar	1=0+1
Semester IV (1)		
Major Courses (0)		
Minor Courses (0)		
Supporting Courses (2)		
Non Credit Compulsory Courses		
PGS – 505 (e course)	Agriculture Research, Research Ethics and Rural Development Programmes	1 = 1 + 0
PGS – 506 (e course)	Disaster Management	1 = 1 + 0
Seminar –692 (1)	Doctoral Seminar	1=0+1
Semester V		
Major Courses (0)		
Minor Courses (0)		
Supporting Courses (0)		
Non Credit Compulsory Courses		
Semester VI		
Major Courses (0)		
Minor Courses (0)		
Supporting Courses (0)		
Non Credit Compulsory Courses		
Theses-699		45
	Total	Credits = 75

Laboratory Facilities and Equipments

This department is having two laboratories one each for Animal Husbandry and Dairy Science. The details are given below

Sr. No.	Instruments	Activities
Animal Husbandry		
1.	Socs, plus automatic	
2.	Analytical balance	
3.	Fibre Plus fibre extraction systems	Fibre Estimation
4.	Milk processing plant	Processing of milk
5.	Gel Documentation	
6.	Centrifuge Refrigerator	
7.	Nitrogen Estimation Assembly	
8.	Muffle Furnace	
9.	Hot Air Oven	
10.	Water Bath	
11.	Blood Analyzer	
12.	Soxhlet Apparatus	
Dairy Science		
1.	Rotary Shaker	
2.	Milking Machine	
3.	Centrifuge Machine	
4.	Voltage Stabilizer	
5.	Analytical Balance	
6.	BOD Incubator	
7.	Deep freezers	
8.	Sand Filter	
9.	Water Activity Analyzer	
10.	Hot Air Oven	
11.	MITSU BISHI Multi Media DLP Projector	
12.	Incubator	
13.	Liquid pouches filling mac	
14.	Liquid pouches filling mac	

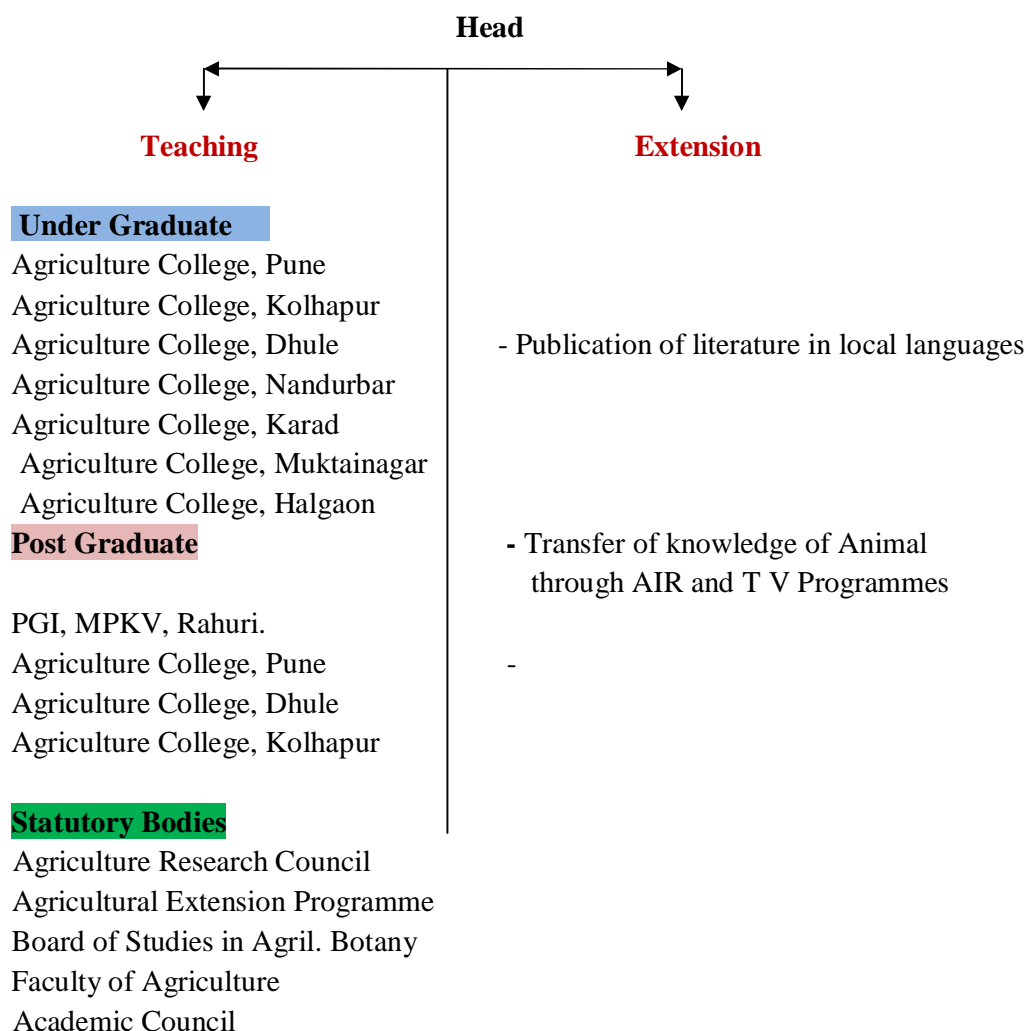


Ultra modern frozen semen laboratory



Dairy Science laboratory

Organizational Profile



Research Projects

On going Research Projects/Programmes /Schemes

Sr. No.	Name of the Research Projects / Programmes / Schemes
1.	Research cum Development Project on Cattle,MPKV,Rahuri
2.	NWP on Pandhपुरi Buffalo ,Shenda Park NARP,Kolhapur
3.	NWP on Sheep Improvement (Farm Base) ,MPKV,Rahuri
4.	AICRP on Sangamneri Goat , MPKV,Rahuri
5.	PG research Unit on Osmanabadi Goat, MPKV,Rahuri
6.	Research unit on Madgyal Sheep , MPKV,Rahuri

Major Achievements

A) Academic :

Number of students completed M.Sc. (Agri.) and Ph.D till date in the Department of Animal Husbandry & Dairy Science:-

Sr. No	Degree Programme	Total
1.	M.Sc. (Agri)	566
2.	Ph.D	51

Instructional Farm

Infrastructure

Well established livestock farms of Cattle, Buffalo, Sheep, and Goat i.e. around 450 Cattle, 400 Goats, 700 Sheep, 100 Buffaloes and demonstration unit of poultry are existing at different centers /colleges in the University Jurisdiction.

Research Programme

Research Recommendation:

Year of Recommendation: 2005-06

Deccani lambs (Sangamneri Strain)

The equation : $BW = (-59.50) + (1.242 \times CG)$ is recommended for prediction of body weights (kg) in Deccani lambs (Sangamneri strain) during 6 to 12 months age based on their chest girth (CG) measurement (cm) with 91% accuracy.

Year of Recommendation: 2008-09

To achieve increased birth and body weight up to three months age, it is recommended that shepherd should include Mahatma Phule Krishi Vidyapeeth, Rahuri developed genetically improved one ram Deccani (Sangamneri) sheep in a flock of 40 to 50 ewes for breeding purpose.

Year of Recommendation:-2010-11

1. Daily feeding of concentrate including 750 gm of heat treated ($75^{\circ}C$ for 2.5 hours) linseed to crossbred cows is recommended for enrichment of milk with omega-3 and omega 6 polyunsaturated fatty acids.
2. The Sangamneri bucks developed through selective breeding are recommended for improvement in growth and milk production performance of goats in its breeding tract.
3. For estimation of body weights, from body measurements of Sangamneri

kids of 6 to 9 months age group the prediction equation viz; Body Weight (kg) = -19.86 + 0.36 (Chest girth cm.) + 0.29 (Body length cm.) is recommended.

4. Feeding kids with concentrate (1/3 of total DM requirement) including 150 gm of heat treated (75⁰C for 2.5 hours) linseed daily is recommended for improving chevon quality with polyunsaturated fatty acids.
5. Addition of rectangular chaffed dry fig at 4 per cent and sugar 30 per cent of buffalo milk *khoa* at the time of pat formation stage is recommended for preparation of value added *burfi* having 15 days self life.
6. A combination of cow whole milk curd (*dahi*), 10 per cent water, 8 per cent sugar and 14 per cent *papaya* pulp is recommended for preparation of value added "Papaya *Lassi*" having five days shelf-life (at 7⁰c) and improved organoleptic quality.

Research outcomes / findings:

RCDP on Cattle

- Developed Phule Triveni crossbred cow yielding 3000 -3500 Lit. milk per lactation with 3.9 to 4.2 per cent fat. Well adapted to field condition.
- Generated 1054 Phule Triveni in the field.
- Prepared Monogram of Phule Triveni of cattle and Sire Directory.
- Established ultra modern frozen semen laboratory with IS-4 system and supplied 2.5 lacs FS doses to farmers, NGOs and field workers.
- Developed protocol to freeze semen of Gir, its crossbreds and Khillar.

Ad-hoc Project on Khillar Cattle

Characterized Khillar cattle and developed breed descriptor

Cattle Breeding farm on Dangi

Characterized and conserved Dangi cattle

Ad-hoc Project on Pandharpuri Buffalo

Characterized Pandharpuri buffalo and developed breed descriptor

Ex- situ Conservation of Buffalo Pandharpuri (2000-2005)

Cryopreserved semen doses of elite Pandharpuri bulls in collaboration with NBAGR, Karnal

Network Project on Pandharpuri (1997 to till date)

- Focused Pandharpuri buffalo at national level and registered as a breed
- Executing Progeny testing Programme in collaboration with NGO's (Gokul, Warana, Yelgud and Shivamrut doodh sangh) and generated 14,814 progenies in field
- Established frozen semen laboratory and supplied 1.5 lacs FS doses of elite Pandharpuri bulls

AICRP on Goats for Mohair (1972-1987)

Developed synthetic Angora to produce Mohair

Network Project on Survey and Characterization of Osmanabadi Goat (1996-2001)

Characterized Osmanabadi goat and developed breed descriptor

Ad-hoc Project on Housing and Management of Osmanabadi Goats (2000 - 2003)

Recommended the semi-stall feeding system of grazing for sustainable goat farming

AICRP on Goat Improvement- Sangamneri field unit (2002 to till date)

- Executing improvement programme in 29 villages of three districts viz., Ahmednagar, Nasik and Pune district
- Characterized Sangamneri goat, Developed breed descriptor
- Registered Osmanabadi and Sangamneri goats as a breed
- Prepared Monogram of Osmanabadi and Sangamneri goats
- Supplied 365 elite males and 268 females to goat keepers
- Achieved 13 % improvement in growth and 22 % in milk production
- Twinning increased up to 52 %.
- Organised three training programmes for goat keepers, one National and two state level seminars, Three Scientist meets and Farmers and Technicians debate on Goat rearing.

Threaten Breed Conservation Project on Sangamneri Goat (2007 to till date)

- Established elite flock of 400 females with 90 males
- The population of Sangamneri goats increased by 185 % in its breeding tract with population of 10,378 goats.

AICRP on Sheep Improvement for mutton (1977-1992)

Developed different crossbred strains of Dorset and Merino with Deccani

Network Project on Sheep Improvement Deccani farm unit (1992-till date)

- Characterized Deccani sheep, Developed breed descriptor and registered as a breed
- Established elite flock of Sangamneri strain
- Supplied 335 elite rams to shephards and achieved 12 % Improvement in growth

Network project on sheep Improvement Deccani field unit (2009-till date)

- Supplied 78 elite Deccani rams in the field and generated 2835 progenies
- Organised two training programmes for shephards

Conservation of Madgyal Sheep (2006 to till date)

Established elite flock of Madgyal sheep

Adhoc project on Rabbit for Meat (1983-1987)

Developed different crossbred strains of Souveiet Chinchella, Grey giant and White giant

Fodder Conservation and Preservation under Western Ghat Zone (1984 - 1988)

- Surveyed for locally available grasses and tree lopping
- Estimated nutritive value of locally available grasses and lopping

NATP Project on locally available Feeds and Fodder (1999 -2002)

Standardized enrichment technique of low grade roughages i.e. 4 % urea treatment to cotton straw for feeding ruminants

Assessment of Mineral Profile (2008 - 2011)

District wise assessment of mineral profile of soil, feed, fodder and animal blood is in progress

Cost and Returns in Milk Production (2012 to till date)

Cost and Returns in Milk Production under diversified systems of two districts viz., Pune and Solapur in collaboration with NDRI, Karnal

Dairy Science

- Filed two patents on low fat spread and alcoholic whey beverage
- Refine the protocols for manufacture of different milk products viz., Khoa, Chhana, Paneer, Butter etc. from High Acid Milk
- Standardised the protocols for Kandi Pedha, Fig burfi, wood apple burfi etc.
- Developed protocols for various value added milk products
- Research carried out on enhancement of shelf life of the milk products by using Herbal preservatives and different packaging materials

Completed Research Projects / Programmes / Schemes

- AICRP on Cattle (1972-1986)
- Ad-hoc Project on Khillar Cattle
- Ad-hoc Project on Pandharpuri buffalo
- Ex- situ Conservation of Buffalo -Pandharpuri (2000-2005)
- AICRP on Goats for Mohair (1972-1987)
- Network Project on Survey and Characterization of Osmanabadi Goat (1996-2001)
- Ad-hoc Project on Housing and Management of Osmanabadi Goats (2000 - 2003)
- AICRP on Sheep Improvement Mutton (1977-1992)
- Adhoc Project on Rabbit for Meat (1983-1987)
- Fodder Conservation and Preservation under Western Ghat Zone (1984 - 1988)
- NATP Project on locally available Feeds and Fodder (1999 -2002)
- Assessment of mineral profile (2008 - 2011)

On going Research Projects / Programmes / Schemes

1.	Research cum Development Project on Cattle, MPKV, Rahuri
2.	NWP on Pandharpuri Buffalo ,Shenda Park NARP, Kolhapur
3.	NWP on Sheep Improvement (Farm Base), MPKV, Rahuri
4.	AICRP on Sangamneri Goat , MPKV, Rahuri
5.	Cost and Returns of the Milk Production, MPKV, Rahuri
6.	PG Research Unit on Osmanabadi Goat, MPKV,Rahuri
7.	Research Unit on Madgyal Sheep , MPKV,Rahuri

Research Publications

Research Publication (NAAS Rating 6.00 or more)

Sr. No.	Title of Research	Name of journal along with Vol, No, page No. and Year	Authors	NASS Rating
1.	Evaluation of Whole sugarcane based Rations in Lactating Crossbred Cows	Animal Nutrition and Feed technology (2015) 15:217-226	S.A Dage, Y.G.Fulpagare and S.H. Mane	6.13
2.	Effect of Protected Protein and Protected fat on Production, reproduction performance and blood metabolites in crossbred cattle	Indian Journal of Animal Sciences 86(8) :913-917, Aug. 2016	Dr. S.H. Mane, Dr. Y.G. Fulpagare , Dr. S.D. Mandakmale Dr. V.E. Narwade, Shri. S.S. Jadhav	6.19
3.	Preliminary identification and characterization of leptin gene polymorphism in Indian goats	Journal of Applied Animal Research (International journal) http://dx.doi.org/10.1080/09712119.2013.795895 ,2013, 3,	A. Maitra, R. Sharma, A. K. Pandey, L. V. Singh, S.D. Mandakmale and B. P. Mishra	6.12
4.	Polymorphisms of BMP4 gene in Indian goat breeds differing in prolificacy	Gene 2013, 532, 140-145	R. Sharma, Sonika Ahlawat, A. Maitra, Manoranjan Roy , S. Mandakmale and M. S. Tantia	8.14
5.	First time characterization of Jy-1-like sequence in goats	South African Journal of Animal Science, 54 (2),198-205,2015	R. Sharma, S. Ahlawat, A. Maitra, M. Roy , S. Mandakmale and M. S. Tantia	6.50
6.	Genotyping of Novel SNPs in BMPR1B, BMP15 and GDF9 Genes for Association with prolificacy in Seven Indian Goat breeds	Animal Biotechnology, 2016, 27(3), 199-207	Sonika Ahlawat, R. Sharma, Manoranjan Roy Sanjay Mandakmale , Ved Prakash and M. S. Tantia	6.76
7.	New genetic polymorphisms in Indian goat BMPR1B gene	Indian Journal of Animal Sciences, 39-44,2014,	Sonika Ahlawat, R. Sharma, A. Maitra, M. S. Tantia, Manoranjan Roy and S.D. Mandakmale	6.13
8.	Identification of Novel SNP in INHBB Gene of Indian goat	Indian Journal of Animal Sciences, 85(1) 55-69,2015	R. Sharma, A. Maitra, Sonika Ahlawat, Manoranjan Roy , S.D. Mandakmale and M. S. Tantia	6.16

9.	Comparison of heritability estimates of first lactation traits by different methods in Phule Triveni cattle.	Indian J. Anim. Sci. 2016, 86(6): 676-681.	Ambhore, G.S., Avtar Singh, Deokar, D.K. , Gupta, A.K., Chakravarty, A.K., Singh, R.K. and Manvendra Singh.	6.19
10.	Heritability estimates of first lactation 300 days milk yield under single versus multi trait animal models in Phule Triveni cattle.	Indian J. Anim. Sci. , 2016, 86(6): 682-685.	Ambhore, G.S., Avtar Singh, Deokar, D.K. , Sahoo, S.K., Manvendra Singh and Divya, P.	6.19
11.	First lactation production and reproduction performance of Phule Triveni cattle in hot arid region of Maharashtra.	Indian J. Anim. Sci. 2017,87(1): 105-108	Ambhore, G.S., Avtar Singh, Deokar, D.K. , Gupta, A.K., Manvendra Singh and Ved Prakash.	6.19
12.	Genetic evaluation of lifetime performancne of Phule Triveni cows by univariate and multivariate methods.	Indian J. Anim. Sci. 2017, 87(2): 177-181	Ambhore, G.S., Avtar Singh, Deokar, D.K. , Manvendra Singh, Sahoo, S.K., and Divya, P.	6.19
13.	Phenotypic, genetic and environmental trends of production traits in Phule Triveni synthetic cow	Indian J. Anim. Sci. 2017, 87(6): 736-741	Ambhore, G.S., Avtar Singh, Deokar, D.K. , Manvendra Singh and Sahoo, S.K.	6.19
14.	Study on host predisposing factors and diagnostic test for canine parvo virus (CPV-2) infection in dogs	Journal of Animal Research 2017 ,7(5):897-902	Shailee M.Pandya,Kisan K Sharma, Isradulla Khan,H.Kalyani and P.S.Sakhare	7.03
15.	Study on factors influencing the birth weight of Deccani sheep	Environment and Ecology 2016, 35 (1A): 207-209	Bangar Y.C., Pachpure S.T. and Nimase R.G.	7.03

Research papers, Practical manual, Books, Book chapters, etc. published during last five years (2012-13 up till now)

Sr. No	Title of Research	Name of journal along with Vol, No, page No. and Year	Authors	NASS Rating
1.	Effects of urea treated maize Stover silage on growth performance of crossbred heifers	IOSR Journal of Agri. And Veterinary Science (IOSR-JAVS) Volume Issue 5 Ver. I (May-2015), PP 58-62	Sekhonyana Thabo Elias, Dr. Y.G. Fulpagare	3.23
2.	Milk yield and composition in Crossbred Cows as Influenced by Feeding Rumen Protected Protein and Fat	Indian J. Animal Nutrition 2016.33(1) 114-117	S.H. Mane, Y.G.Fulpagare , D.K. Deokar, D.H. Kankhare and S.B. Adangle	4.51
3.	Studies on serum Biochemical profile in lactating crossbred cows	Journal of Agriculture and Technology 41(1) : 132-134 (2016)	Dr. V.E. Narwade, Dr. M.M. Yadav, Dr. S.H. Mane, Shri. S.S. Jadhav Dr. Y.G. Fulpagare	4.18
4.	Effect of Protected Protein and Fat on Performance of Crossbred Cattle	J. Agric. Res. Technol., 41 (2) :292-297 (2016)	S.H. Mane, Y.G.Fulpagare , D.H. Kankhare, V.S. Lawar and B.D. Patil	3.18
5.	Effect of Different Feed Combination on Quality of Milk in Gir Crossbreed	Contemporary Research in India (ISSN 2231-2137): VOL. 7: ISSUE: 2 (2017); pp115	Y. G. Fulpagare , S. B. Argade, D. K. Deokar, S. S. Jadhav and U. S. Gaikwad	3.94
6.	Staphylococcus aureus has a cause of endometritis and its multiple drug resistance in crossbred cow at organized farm	National Seminar on recent trends in plant sciences and Agricultural research 11-12 Jan, 2018 organized by Contemporary Research in India, ZARS, Solapur	Dr. M.M. Yadav, Dr. V.E. Narwade, Dr. Y.G. Fulpagare	3.23
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21.	Selection indices for Osmanabadi goats	Bio infolet 2014 ,11(1A)26-28	S.P.Rathod,D.K.Deokar, D.R.Birari, S.D.Mandakmale, S.S. Jadhav and D.P.Kaledhonkar	3.28
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34.	Pre-weaning growth performance of Deccani lambs under field condition in Ahmednagar district	Trends in bioscience 10(37) 7682-7683,2017	S.B.Adangale, and R.G.Mali	3.94
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Contact Details

Head,
Department of Animal Husbandry and Dairy Science,
MPKV, Rahuri, Tal. Rahuri 413 722
Dist. Ahmednagar (MS)
Phone: 02426 243 213
E-mail: hodasds@gmail.com, hodahds.mpkv@gov.in