Technology Backstopping & Policy Insight of Livestock & Fisheries Sector in Bihar

(A Resource Manual)

BASU

Directorate of Extension Education
Bihar Animal Sciences University, Patna
ICAR-Agricultural Technology Application Research Institute, Patna

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Dr. Y. S. Jadoun
Dr. Pragya Bhadauria
Dr. Pankaj Kumar
Dr. N. S. Dahiya

Directorate of Extension Education
Bihar Animal Sciences University, Patna
ICAR-Agricultural Technology Application Research Institute, Patna

Concept & Guidance:
Dr. Inderjeet Singh
Dr. Anjani Kumar

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Dr. Y. S. Jadoun
Dr. Pragya Bhadauria
Dr. Pankaj Kumar
Dr. N. S. Dahiya

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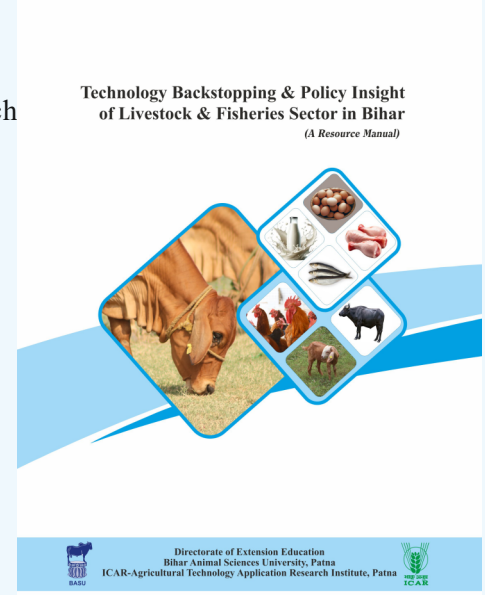

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बिहार पशु विज्ञान विश्वविद्यालय
बिहार पशु चिकित्सा महाविद्यालय प्रांगण, पटना–800014
BIHAR ANIMAL SCIENCES UNIVERSITY
BIHAR VETERINARY COLLEGE CAMPUS, PATNA-800014

डॉ0 इन्द्रजीत सिंह
कुलपति
Dr. Inderjeet Singh
Vice Chancellor

☎ 0612-2222221
Email : vc-basu-bih@gov.in
vicechancellorbasu@gmail.com

From the Desk of the Vice-Chancellor

Bihar state is characterized by its high population density, fragmented landholdings, and growing climatic uncertainties, the livestock sector serves as a critical pillar for enhancing farm incomes, generating rural employment, and ensuring food and nutritional security. Its strategic importance in Bihar's agrarian economy cannot be overstated.

Unlocking the full potential of this sector requires strong technological backstopping, evidence-based policy interventions, and efficient, farmer-oriented extension delivery systems. The publication titled "*Technology Backstopping & Policy Insight of Livestock & Fisheries Sector in Bihar*" has been prepared with the objective of strengthening the linkage between research innovations, field-level implementation, and informed policy formulation.

This document highlights the imperative of reinforcing technology dissemination through Krishi Vigyan Kendras, promoting capacity building, fostering institutional convergence across departments, and leveraging digital extension platforms, while systematically addressing prevailing structural and operational challenges.

I am pleased to acknowledge that this resource guide has been crafted as a comprehensive reference for policymakers, planners, scientists, extension professionals, veterinarians, development practitioners, and progressive farmers. It is my sincere hope that the insights and recommendations contained in this document will enable evidence-based decision-making, advance sustainable development, and make a meaningful contribution to enhancing the income, resilience, and overall well-being of livestock farming communities in Bihar.

Dr. Inderjeet Singh
Vice Chancellor, BASU, Patna

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ICAR- Agricultural Technology Application Research institute, Zone-IV, Garbhuchak, Jagdeopath, Patna- 800014, (Bihar)

डॉ0 अंजनी कुमार
Dr. Anjani Kumar
निदेशक/Director

bey: E-mail: atari.patna@icar.gov.in
Website: https://ataripatna.icar.gov.in/
Twitter: @AtariPatna
Phone: 0612-2226086/2226950

Foreword

In Bihar, Krishi Vigyan Kendras (KVKs) play a pivotal role in strengthening livestock development through technology transfer, capacity building, and field-level advisory services. Through sustained technical support, and systematic monitoring, KVKs will play a crucial role in improving livestock productivity and enhancing farmers' income across the state.

This manual "*Technology Backstopping & Policy Insight of Livestock & Fisheries Sector in Bihar*" presents a focused synthesis of proven technologies and policy perspectives emerging from research and stakeholder engagement across the state. The content highlights location-specific, farmer-centric approaches and various extension innovations.

A key strength of this publication is its emphasis on institutional convergence, particularly the coordinated role of the Bihar Animal Science University (BASU) and Krishi Vigyan Kendras (KVKs) in providing technical backstopping, capacity building, and last-mile delivery of livestock technologies to farmers of Bihar.

It is hoped that this publication will serve as a practical reference for various stakeholders and contribute to sustainable livestock development in the state through strong research–extension convergence.

(Anjani Kumar)

BIHAR ANIMAL SCIENCES UNIVERSITY

BIHAR VETERINARY COLLEGE CAMPUS, PATNA- 800014

Directorate of Extension Education

डॉ0 निर्मल सिंह दहिया
निदेशक प्रसार शिक्षा
Dr. Nirmal Singh Dahiya
Director Extension Education

Ph. No. : 0612-2227261
Email: deebasupatna@gmail.com

Preface

The publication *"Technology Backstopping & Policy Insight of Livestock & Fisheries Sector in Bihar,"* brought out by the Directorate of Extension Education, Bihar Animal Sciences University (BASU), seeks to present a concise and practice-oriented compilation of validated technologies and policy perspectives spanning breeding, feeding, animal health, and extension systems in the fields of animal and fisheries sciences. Particular emphasis has been laid on fostering institutional convergence in technology assessment, capacity building, and field-level technical backstopping.

The editorial team expresses its profound gratitude for the guidance and encouragement of the Hon'ble Vice-Chancellor, BASU, and for the valued cooperation of the Director, ICAR–ATARI, Patna, in strengthening institutional linkages and extension initiatives. Heartfelt appreciation is also extended to all contributors, scientists, extension professionals, and field functionaries whose expertise and field experiences have significantly enriched this publication.

It is the earnest hope of the editorial team that the insights and recommendations presented herein will support informed decision-making, reinforce research–extension linkages, and contribute to the sustainable, inclusive, and resilient growth of the livestock sector in Bihar.

Dr. Nirmal Singh Dahiya
DEE, BASU, Patna

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Overview

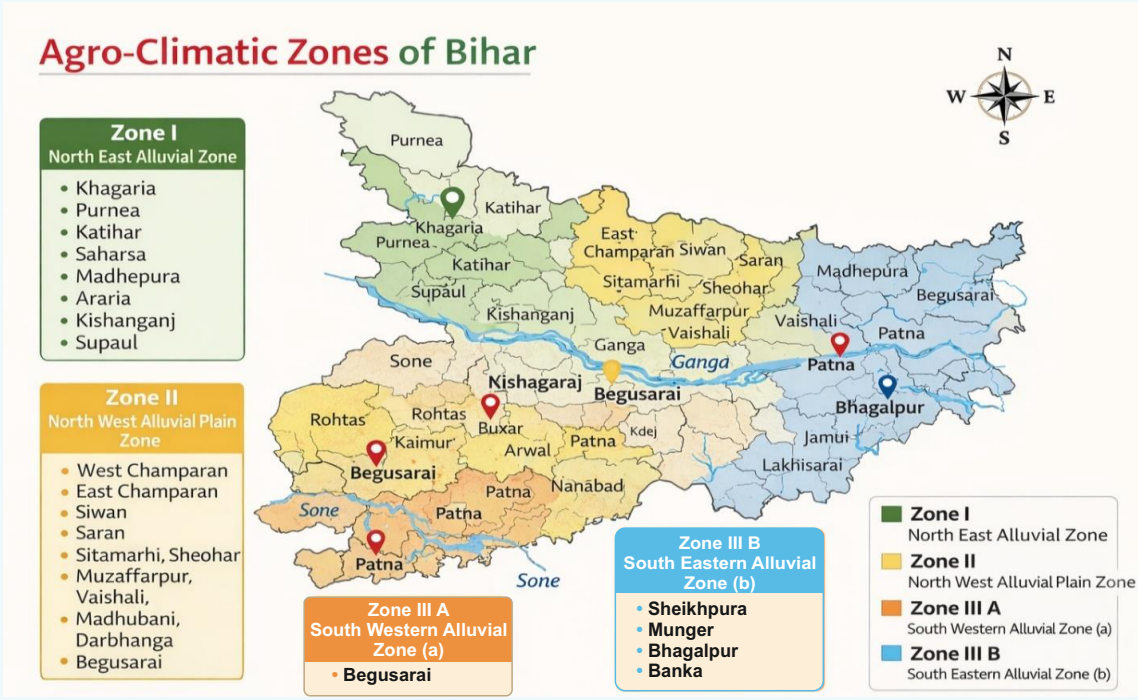


Table 1: Analysis of Livestock Production Systems in Bihar

Criteria	Northern Zone	Central Zone	Southern Zone
Major livestock species	Cattle Buffaloes Goats Poultry	Cattle Buffaloes Goats Poultry Sheep	Cattle Buffaloes Goats Sheep Poultry
Livestock feeding pattern	Semi-intensive system (Grazing + Stall feeding)	Semi-intensive system (Grazing + Stall feeding); Extensive system (Goats & Sheep)	Semi-intensive system (Grazing + Stall feeding); Extensive system (Goats & Sheep)
Major challenges	Flood-prone conditions	Densely populated region	Drought-prone conditions
Production opportunities	Indigenous cattle & 50% Jersey suitable Large goat population; Poultry piggery potential	Suitable for higher-grade Holstein-Friesian & Jersey crossbreds Poultry piggery potential	Indigenous cattle & 50% Jersey suitable Poultry piggery potential

LIVESTOCK SCENARIO IN BIHAR

Bihar plays a significant role in India's livestock sector, particularly in milk and goat production. The total mammalian and avian genetic resources of the state are 30.342 million and 11.420 million, respectively. Among domestic mammalian livestock species, cattle constitute 41.4%, making them the largest single livestock species in the state. Bihar possesses 6.3% of the country's cattle population. Moderate shares in buffaloes and poultry point towards scope for further development through interventions in genetics, nutrition, health, and market linkages. According to the 20th Livestock Census (2019), Bihar's total livestock population is 36.6 million, contributing 4.8% to India's total livestock population of 536.8 million. The species-wise percentage shares are given below.

Table : Livestock diversity in India *vis-à-vis* Bihar

Species	Population in India (Million)	Population in Bihar (Million)	% Share
Cattle	193.46	15.4	7.96%
Buffaloes	109.85	7.72	7.03%
Sheep	74.26	0.21	0.28%
Goats	148.88	12.82	8.61%
Pigs	9.06	0.34	3.75%
Horses and Ponies	0.34	0.03	8.82%
Camel	0.25	0.0001	0.04%
Poultry	851.81	16.53	1.94%

Source: 20th Livestock Census,2019

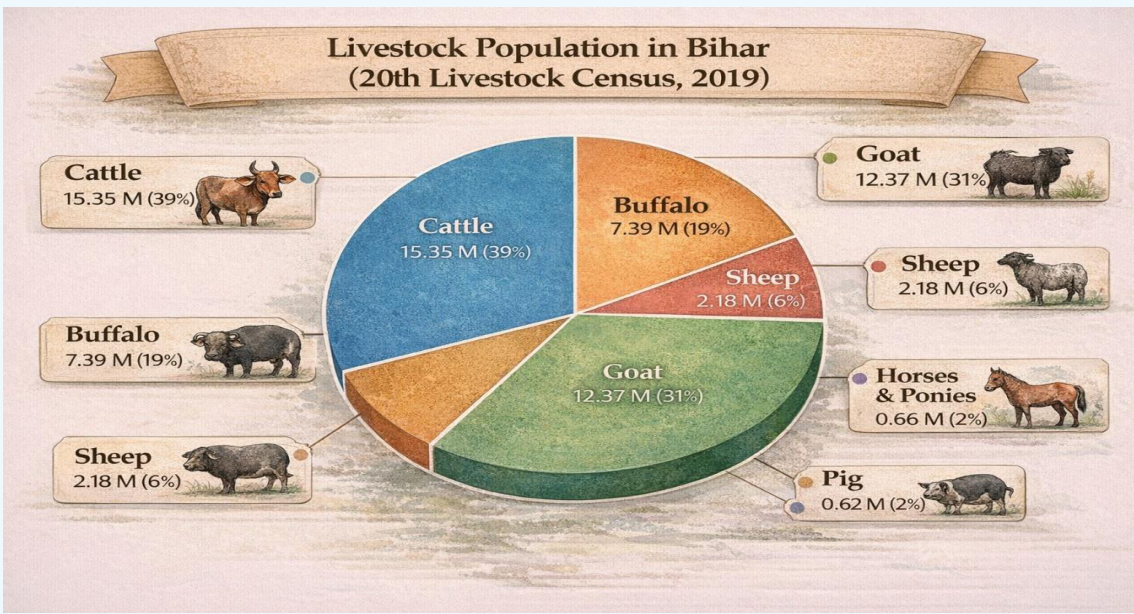


Fig 1: Diagrammatic representation of livestock population in Bihar

Changes in livestock population over the census period (2003-2019)

The changes in livestock population in Bihar over the census period from 2003 to 2019 and reveals an overall positive growth trend in the livestock sector. The population of cattle and buffalo increased steadily throughout the period, reflecting their continued importance in agriculture and dairy-based livelihoods. Goat population showed a strong and consistent rise, indicating its growing preference among small and marginal farmers due to low input requirements and better adaptability. Poultry recorded the most significant increase and emerged as the largest livestock group by 2019, highlighting rapid expansion of commercial and backyard poultry farming in the state. In contrast, sheep population remained very low and showed a declining trend after 2007, while pig population stayed minimal with only slight fluctuations. Overall, the graph suggests a gradual shift in Bihar's livestock composition toward small ruminants and poultry, driven by economic viability, changing demand patterns, and livelihood diversification.

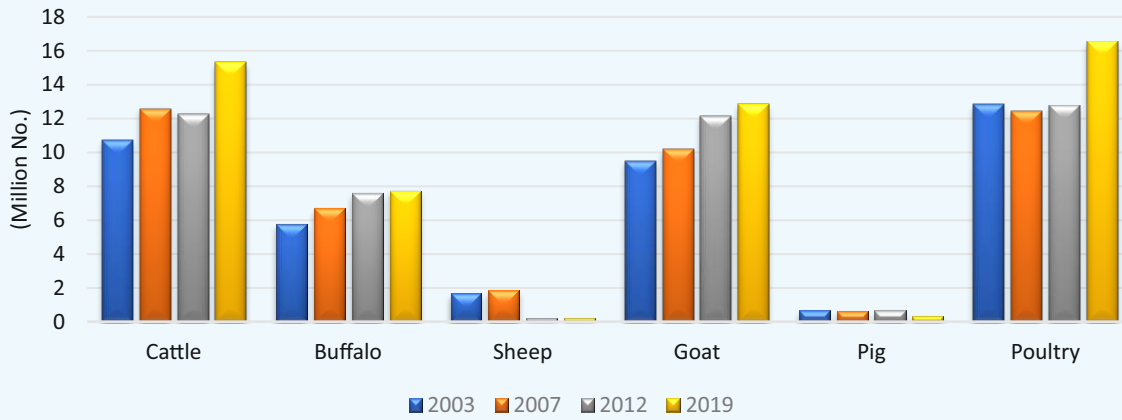


Fig: Changes in Livestock Population in Bihar

Table : Details of registered & unregistered animal resource in Bihar

Species	Population (in Million)	Number of Registered Breeds	Unregistered Population (%)
Cattle	15.4	03	60.93%
Buffalo	7.72	–	69.29%
Goat	12.82	–	55.29%
Sheep	0.21	01	80.76%
Horses & Ponies	0.032	–	–
Pig	0.34	01	92.41%

Fisheries Dynamics in Bihar

The fisheries sector in Bihar has emerged as one of the fastest-growing components of the agricultural economy. Despite being a landlocked state, Bihar possesses rich inland water resources that provide immense potential for fish production, employment generation, and nutritional security. Over the last two decades, the sector has transitioned from traditional capture fisheries to technology-driven aquaculture systems, resulting in substantial growth in production and productivity.

Fisheries today contribute significantly to rural livelihoods, income diversification, and protein supply, especially among economically weaker sections.Bihar's fisheries are primarily inland freshwater systems made up of:

- Riverine fisheries in the Ganga, Gandak, Kosi, Bagmati, Sone, Punpun and other tributaries
- Wetlands (chaurs/oxbow lakes) formed from floodplain dynamics
- Ponds, tanks and reservoirs used for aquaculture and capture fisheries
- The growth trend is upward in fish production over the last two decades. Production increased from approximately 2.6 lakh tonnes in 2001–02 to about 7.6 lakh tonnes in 2022–23, indicating nearly a threefold increase.

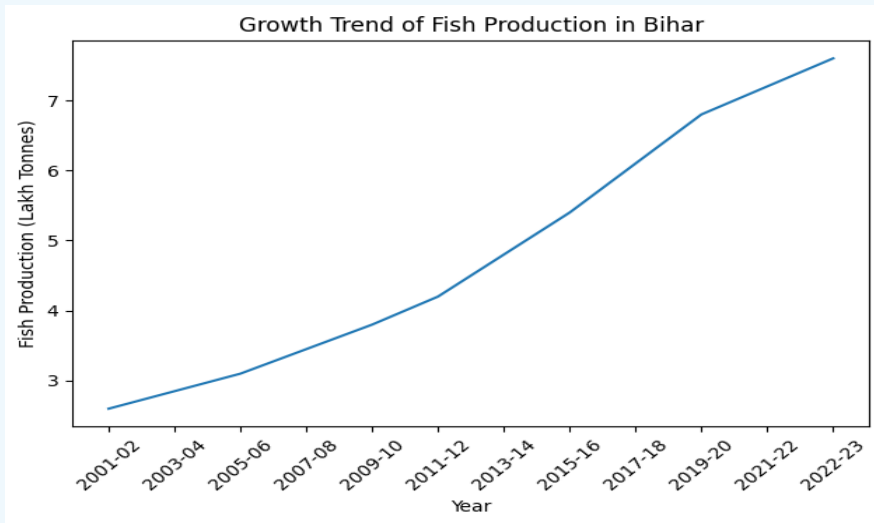


Table: 3 Important Fish Species of Bihar

Group	Species	Role in Fisheries
Indian Major Carps (Cyprinidae)	*Catla*, *Rohu*, *Mrigal*	Major cultured and wild catch species
Other Carps & Minnows	Trout Barb, Moustached Danio, Stone Carp	Biodiversity indicators; some local fisheries
Catfishes (Siluriformes)	*Eutropiichthys vacha*, Pangasius, Mystus spp.	Bottom feeders; important in capture fisheries
Snakeheads & Feathebacks	*Channa* spp., *Notopterus*	Adapted to floodplain/slow waters
Prawns & Crustaceans	*Macrobrachium rosenbergii*	Aquaculture focus

Registered Indigenous Livestock Genetic Resources of Bihar

S.No.	Characteristis	Breeds

1. Purnea Cattle

- Native to Purnea, Araria, Katihar, Kishanganj
- Small-sized, hardy, heat tolerant
- Milk yield: 0.5–2.0 kg/day (≈4.5% fat)
- Bullocks affordable and good for light draught work

2. Bachaur Cattle

- Native to Madhubani, Sitamarhi, Darbhanga
- Primarily a draught breed
- Can work 6–7 hours continuously
- Milk yield low (~2.2 kg/day)
- Threatened due to crossbreeding

3. Ganagatriri Cattle

- Found along river Ganga (Bihar & Eastern UP)
- White/grey coat, good adaptability
- Moderate milk yield (>1000 L/lactation)
- Suitable for small and marginal farmers

4. Shahbadi Sheep

- Native to Bhojpur, Rohtas, Buxar, Patna
- Medium-sized, hardy, meat type
- Low wool yield, coarse wool
- Important income source for landless farmers

5. Black Bengal Goat

- Widely distributed in Bihar
- Highly prolific and disease resistant
- Excellent meat and skin quality
- Low input, high economic return

S.No.	Characteristis	Breeds

6. Purnea Pig (Vananchal Black)

- Native to Purnea & Katihar (Bihar)
- Scavenging-based rearing system
- Early maturity and good dressing percentage
- Important livelihood for tribal farmers

7. Maithali duck

- Found in flood-prone areas of North Bihar
- Egg production: 120–140 eggs/year
- High fertility and hatchability
- Managed mainly by women

8. Chicken suitable for Bihar

- Red Cornish–meat purpose
- Plymouth Rock–dual purpose
- Rhode Island Red–high egg production
- White Leghorn–low input, high egg production
- Kadaknath–medicinal meat

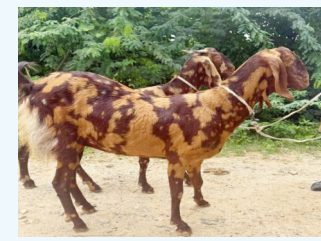
9. Lesser-Known Indigenous Livestock Breeds

- Champaran Goat–meat-type, hardy, prolific
- Banka Cattle–small-sized, hill-adapted, low input
- Angika Buffalo–milk-type, flood-adapted
- Khagaria Pony–pack animal, flood-resilient
- Kishanganj Indigenous Chicken –free-range, disease tolerant

Recommended germplasm for dairy breed improvement in Bihar

S.No.	Characteristis	Breeds
1.	**Sahiwal** • Highly resistant to parasites and heat-tolerant • Brownish-red coat (mahogany red to greyish red shades) • Average lactation yield: ~2325 kg • Lactation yield range: 1600–2750 kg • Fat content: 4.5–6.0% • Milk yield up to 6000 kg recorded under organized farm condition	
2.	**Red Sindhi** • Indigenous, heat-tolerant milch breed from Sindh (Pakistan) • Coat colour: Red (dark red to light shades, sometimes with white markings) • Lactation milk yield: 1100–2600 kg • Average milk yield: ~1840 kg per lactation • Milk fat content: 4.0–5.2%	
3.	**Murrah** • Jet black coat with white marking on tail • Tightly curved, sickle-shaped horns • Average lactation yield: 1500–2500 kg • Milk fat content: 6.0–8.0% • Used for grading-up of inferior buffaloes • Peak daily milk yield: 14–16 litres • Maximum recorded yield: up to 31.5 kg/day	

Recommended germplasm for goat and poultry breed improvement in Bihar

S.No.	Characteristis	Breeds
1.	**Barbari Goat** • Indigenous dual-purpose breed of North India (mainly Uttar Pradesh) • White coat with brown/red patches, small erect ears, short straight horns; • Milk yield about 0.8–1.5 L/day (100–150 L per lactation); good meat quality with • ~45–50% dressing percentage. • Highly prolific (twins/triplets common), early age at first kidding (12–15 months)	
2.	**Sirohi Goat** • Native to Rajasthan (Sirohi district); medium to large-sized meat-type breed. • Brown coat with light or dark patches, medium-length ears, strong body, and curved horns. • Primarily reared for meat; good growth rate and satisfactory dressing percentage (~45–50%). Milk yield is moderate. • Hardy breed, well adapted to arid and semi-arid regions; performs well under extensive and semi-intensive systems	
3.	**Vanraja** • Dual purpose (meat and eggs) multi-colored plumage breed developed by ICAR-Directorate of Poultry Research for rural backyard farming systems • Attains 1.5–2.0 kg body weight by 8–10 weeks; lays about 140–180 eggs/year under backyard conditions. • Hardy, disease tolerant, good scavenging ability; ideal for low-input rural and tribal farming.	
4.	**Kadaknath** • Indigenous breed from Madhya Pradesh (Jhabua region); recognized as a unique black meat chicken of India. • Entire body parts including feathers, skin, meat, bones, and internal organs are black due to fibromelanosis. • Primarily meat-type; slow growing but produces high-protein, low-fat, medicinal-value meat; lays about 100–120 eggs/year. • Hardy, disease resistant, suitable for backyard and low-input farming systems	

BASUMIN Mineral Mixture

BASUMIN Mineral Mixture has been developed as a scientifically balanced supplement to meet the mineral requirements of livestock.

Regular supplementation of BASUMIN helps improve animal health, reproductive efficiency, and sustainable milk production.

Recommended Daily Feeding Rate

- Calves (male/female): 20–25 g per day
- Growing heifers: 50–75 g per day
- Lactating animals: 100–150 g per day (depending on milk yield)
- Goats and sheep: 5–10 g per day

The quantity may be adjusted as per the advice of an animal nutritionist or veterinarian.

Fig : BASUMIN Mineral Mixture

Key Benefits of BASUMIN Mineral Mixture

- Enhances overall milk production
- Maintains milk yield for a longer lactation period
- Prevents sudden decline in milk production
- Ensures timely onset of heat in cows and buffaloes
- Improves conception rate and reduces repeat breeding
- Enhances reproductive efficiency
- Promotes early maturity and timely conception in heifers
- Reduces abnormal behaviors such as soil licking and urine drinking caused by mineral deficiencies

Method of Feeding

BASUMIN Mineral Mixture can be easily fed by mixing it thoroughly with concentrate feed or regular fodder. Daily supplementation ensures optimum absorption and maximum.

Urea Molasses Mineral Block (UMMB)

UMMB (Pashu Chocolate)

Helps to increase microbial population in rumen Increase the appetite of animals !!!!!!!!!!!! Increase Protein and Mineral intake !Increase digestibility Increase the milk production Reduce anestrus and repeat breeding. **Size:** 1.0-1.25 kg, **Dose-** 300-500g /day/animal

Ingredients	Proportion(%)
Molasses	42.5
Urea	10
Wheat bran	15
Rice polish	10
Horse gram	5
Mineral mixture	10
Salt	5
Sodium bicarbonate	2.5

Complete Feed Block (CFB)

The complete feed block (CFB) has been defined as a mixture of processed feed stuffs (roughages and concentrates) presented in form which precludes selection and which is designed to be the sole source of feed.

Due to each bite of feed having the same composition, would be minimizing fluctuations in the substrate in the rumen and hence enhanced rumen fermentation efficiency.

A 5-10 percent increase in the efficiency of feed utilization, and 5 to 8% increase in milk/ fat production can be expected compared to a conventional feeding.

Composition of complete feed block

Ingredients	Qty (%)	CP	TDN
Paddy/Wheat straw	47	1.88	21.15
Maize	10	0.8	8
DORB	20	3.6	11
Mustard Cake	5	1.85	3.75
Rice polish	5	0.6	3.5
Molasses	10	0.3	6.5
Mineral mixture	2		
Salt	1		
Dolomite	1		
Total	**100**	**9.03**	**53.9**

Salt Lick

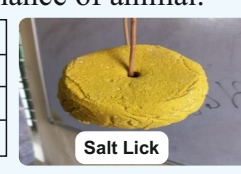
Dose: Goat & sheep-20-25gm/day licking

Cattle/ Buffalo-100-150g/day licking

Benefits: !Improve digestion !Increase the water intake capacity of animal. ! Ameliorate heat stress !Source of Calcium and other minerals !Recovery from PICA !Improve the productive and reproductive performance of animal.

Nutritive value of salt lick	
Nutrients	**%**
Calcium	20
Phosphorus	4
Magnesium	19.2
Sodium	11
Chlorine	18

Physical Specifications of Salt lick	
Diameter (cm)	11-13
Height (cm)	5
Weight (kg)	1



Nutritious Fodder – Azolla

Azolla is a free-floating aquatic fern that grows on the surface of water. A blue-green algae (*Anabaena*) lives symbiotically on the surface of Azolla. This algae plays an important role in biological nitrogen fixation.

Nutritional Value of Azolla: It is rich in

- Protein
- Essential amino acids
- Vitamins (Vitamin A, Vitamin B_{12}, and beta-carotene)
- Growth-promoting substances
- Minerals such as calcium, phosphorus, potassium, iron, copper, and magnesium

Because of its nutritional composition, Azolla serves as an excellent supplementary feed for livestock. It is easily digestible for goats due to its high protein and low lignin content. Research studies have shown that feeding Azolla helps to improve milk quality, goat health, and longevity. It can be effectively used as a feed supplement for goats.

Method of Azolla Production

Spread 10–15 kg of sieved fertile soil evenly over a silpaulin-lined pit. Dissolve 2 kg cow dung and 30 g superphosphate in 10 litres of water and pour into the pit. Add water to maintain a depth of about 10 cm. Then introduce 500 g to 1 kg Azolla culture into the pit.

- Azolla grows rapidly and spreads across the pit within 10–15 days. Thereafter, 400–600 g Azolla can be harvested daily.
- Add 20 g superphosphate and about 1 kg cow dung to the pit once every five days to maintain rapid growth.
- Under proper management, about 500 g Azolla per pit per day can be produced continuously.
- To increase mineral content, a balanced micronutrient mixture containing magnesium, iron, copper, sulphur, etc. may be added periodically in recommended quantities.
- Pest and disease incidence in silpaulin-based pits is minimal. However, insect infestation may occur during dense growth. This can be controlled by applying malathion at 10 g per square metre. Mixing Azolla with a bavistin solution can also help prevent fungal infection.
- If pest infestation becomes severe, the pit should be cleaned completely and fresh cultivation should be started at a new location.

Method of Feeding

- Harvest Azolla and wash it thoroughly with clean water to remove the smell of cow dung.
- Separate the small plants properly.
- Mix fresh Azolla with concentrate feed in a 1:1 ratio and feed to goats.
- Fresh Azolla may also be fed directly.

- Azolla can be mixed with regular feed in a 1:1 ratio and fed for about one week, after which animals become accustomed to its taste.

Precautions

- The ideal temperature for Azolla cultivation is 25–30°C. Growth slows at higher temperatures.
- The pit should be constructed in a shaded area to avoid direct sunlight, which reduces yield.
- Ensure the pit receives adequate diffused light.
- Cow dung and superphosphate should be added regularly to maintain rapid growth.
- Control pests and fungal diseases whenever required.
- Replace about 5 kg of soil with fresh soil every 30 days to prevent nitrogen excess and micronutrient deficiency.
- Maintain water depth at 25–30 cm and replace water every 10 days.
- Clean the tank thoroughly every six months and restart cultivation with fresh water, cow dung, and Azolla culture.
- If pest or fungal infestation recurs, shift cultivation to a new pit with fresh Azolla culture.
- Periodically test the pH of the Azolla tank.

Fig : Azolla Production

Urea Treatment of Straw

- Crop residues such as straw and chaff are commonly used as roughage for livestock, especially during fodder-scarce periods. However, untreated straw is very low in nutritive value. It contains negligible digestible protein and a relatively high amount of silica (about 5–10%), which reduces digestibility and limits animal productivity.
- To overcome this problem, urea treatment of straw is a simple, low-cost, and effective technology that significantly improves its feeding value.

Why Urea Treatment is Important

- Increases crude protein content of straw
- Improves digestibility and palatability
- Enhances feed intake by animals
- Supports better milk production, growth, and body condition
- Makes efficient use of locally available crop residues

Method of Urea Treatment

- Spread 100 kg of straw/chaff evenly on a plastic sheet.
- Dissolve 4 kg urea in 40 liters of water.
- Sprinkle the urea solution uniformly over the straw/chaff and mix well.
- Cover the treated straw with a plastic sheet to minimize air entry.
- Keep it sealed for three weeks, then take it out according to the feeding requirement.
- After brief aeration, feed it to the animals.

Fig: Urea Treatment of Fodder

Precautions

- Use only the recommended quantity of urea
- Ensure proper airtight sealing during storage
- Do not feed untreated or freshly treated straw directly
- Always allow aeration before feeding

Benefits to Livestock Farmers

- Reduces dependence on costly concentrates
- Ensures year-round availability of nutritious roughage
- Improves animal health and productivity
- Economical and farmer-friendly technology

Silage Production

Silage making is an effective method of preserving green fodder for long periods while maintaining its nutritional quality. Maize is one of the best crops for silage due to its high energy content, good fermentability, and palatability for livestock.

Why Maize Silage is Important

- Ensures year-round availability of green fodder
- Rich in energy and digestible nutrients
- Highly palatable and easily digestible
- Improves milk yield, body weight, and animal health
- Reduces fodder wastage and feeding cost

Fig: Silo Pit

Ideal Stage for Harvesting

- Harvest maize at milk to dough stage
- Crop age: 60–75 days (depending on variety)
- At this stage, the crop contains optimum moisture (65–70%) for good fermentation

Step-by-Step Method of Maize Silage Preparation

1. Harvest the maize crop at the milk–dough stage when cobs are well formed and leaves are still green.
2. Chop the maize plants into 2–3 cm long pieces using a chaff cutter. Proper chopping helps in better compaction and fermentation.
3. Prepare silage in a pit, trench, bunker, or plastic drum/bag, depending on availability. The structure should be clean and dry.
4. Fill the pit layer by layer with chopped maize fodder. Compact each layer properly by trampling or pressing to remove trapped air.
5. After filling, cover the pit tightly with a plastic sheet and seal it with soil or mud to make it completely airtight.
6. Allow the fodder to ferment for 30–45 days without opening the pit. Proper anaerobic conditions ensure good-quality silage.
7. After fermentation, open the pit from one side only. Remove silage daily as per requirement, resealing the pit after use.

Characteristics of Good-Quality Silage

- Yellowish-green to light brown color
- Pleasant fruity or acidic smell
- Soft texture, not slimy or moldy
- pH around 3.5–4.2

Fig: Ready to use silage

Precautions

- Do not harvest over-mature or very dry crops
- Ensure proper compaction and airtight sealing
- Avoid water entry into the pit, never feed moldy or spoiled silage

Hydroponic Fodder Production

Hydroponic fodder from maize and wheat is a climate-smart, farmer-friendly technology that ensures year-round supply of fresh green fodder, especially useful during fodder scarcity, drought, or urban livestock systems. Hydroponic fodder is a soil-less, water-based method of producing highly nutritious green fodder within a short time. Maize and wheat are the most commonly used grains due to their high germination rate, palatability, and nutritional value.

Why Hydroponic Fodder is Important

- Fresh green fodder available within 7–10 days
- Requires very little water (80–90% less than field crops)
- No land or soil required
- Rich in enzymes, vitamins, and digestible nutrients
- Improves milk yield, animal health, and feed efficiency
- Ideal for small, landless, and peri-urban farmers

Fig: Hydroponic Fodder

Suitable Grains

- Maize grain – high energy, good for dairy animals
- Wheat grain – rich in protein and fiber
- Use clean, bold, disease-free grains with good germination (>90%)

Method of Hydroponic Fodder Production

- Select healthy maize or wheat grains; remove broken, shriveled, and damaged seeds
- Wash grains thoroughly with clean water
- Soak grains in clean water: Maize – 10–12 hours; Wheat – 8–10 hours
- To prevent fungal growth, dip seeds in 0.1% sodium hypochlorite or mild fungicide solution for 5–10 minutes, then rinse well
- Drain water and keep soaked seeds in a gunny bag or tray for sprouting: Maize – 24–36 hours; Wheat – 24 hours
- Allow small sprouts to appear, indicating readiness for spreading
- Spread sprouted seeds evenly in perforated plastic trays
- Recommended seed rate per 1×2 ft tray: Maize – 1.0–1.2 kg; Wheat – 0.8–1.0 kg; avoid overcrowding
- Sprinkle water 2–3 times daily
- Maintain temperature 18–30°C and humidity 60–80%
- No soil, fertilizer, or chemicals required; ensure good ventilation and indirect sunlight
- Fodder becomes ready in 7–10 days, reaching a height of 20–25 cm

- A thick mat of green shoots with roots forms
- Harvest the entire mat (shoot + root) and feed fresh to animals, chopping if required

Nutritional Benefits

- High digestibility and palatability
- Rich in vitamins A, E, B-complex
- Improved protein availability
- Enhances rumen function and feed intake

Feeding Recommendation: Hydroponic fodder should be fed along with dry fodder and concentrate, not as the sole feed.

- Dairy cows/buffaloes: 5–10 kg/day
- Goats/sheep: 1–2 kg/day
- Poultry (limited use): finely chopped

Fig: Hydroponic Fodder

Precautions

- Maintain hygiene to avoid fungal growth
- Avoid excess watering (prevents root rot)
- Clean trays daily after harvesting
- Use clean, potable water only
- Do not store harvested fodder for long periods

Advantages over Conventional Fodder

- No dependence on land or season
- Quick production cycle
- Minimal water requirement
- Consistent quality throughout the year

Fig: Hydroponic Fodder

Recommended fodder crop and their varieties for Bihar

Fodder Crop	Recommended Varieties
Agro-climatic Zone I (North West Alluvial Zone)	
Sorghum	UP Chari-1,2; Pusa Chari-1; MP Chari; PC-6-9; Raj Chari-1,2
Maize	J-1006; African Tall; Vijay; Moti; Jawahar Composite
Cowpea	EC-4216; UPC-5286; GFC-1,3,4; BL-1,2; UPC-622
Oat	JHO-851; JHO-992; HFO-114; OS-7; UPC-94; UPC-212; JHO-822; JHO-2009-1
Berseem	Mescavi; Wardana; BL-1; BL-2; BC-180
Lucerne	Sirsa-8; Anand-2; Anand-3; RL-88; CO-1; T-9; Chetak
Bajra Napier Hybrid	IGFRI Hybrid Napier No.3; NB21
Guinea grass	Bundel Guinea-1; Bundel Guinea-2; PGG-14
Agro-climatic Zone II (North East Alluvial Zone)	
Sorghum	UP Chari-1,2; Pusa Chari-1; MP Chari; PC-6-9; Raj Chari-1,2
Pearl millet	Raj Bajra Chari-2; CO-8; Avika Bajra-1; Giant Bajra
Maize	J-1006; African Tall; Vijay; Moti; Jawahar Composite
Cowpea	EC-4216; UPC-5286; GFC-1,3,4; BL-1,2; UPC-622
Oat	JHO-851; JHO-992; HFO-114; OS-7; UPC-94; UPC-212; JHO-822; JHO-2009-1
Berseem	Mescavi; Wardana; BL-1; BL-2; BC-180
Bajra Napier Hybrid	IGFRI Hybrid Napier No.3; NB21
Guinea grass	Bundel Guinea-1; Bundel Guinea-2; PGG-14
Marvel grass	JHD-2013-2
Anjan grass	Bundel Anjan-1; Bundel Anjan-3
Agro-climatic Zone III (Southern & South-Eastern Bihar)	
Sorghum	UP Chari-1,2; Pusa Chari-1; MP Chari; PC-6-9; Raj Chari-1,2
Pearl millet	Raj Bajra Chari-2; CO-8; Avika Bajra-1; Giant Bajra
Cowpea	EC-4216; UPC-5286; GFC-1,3,4; BL-1,2; UPC-622
Guar	BG-1; BG-2; BG-3; Agaita Guara-112; HG-75; H82; Guara-80
Rice bean	Bidhani-1; KRB-4; RBL-6; Surbahi; JRB-105-2
Oat	JHO-851; JHO-992; HFO-114; OS-7; UPC-94; UPC-212; JHO-822; JHO-2009-1
Berseem	Mescavi; Wardana; BL-1; BL-2; BC-180
Lucerne	Sirsa-8; Anand-2; Anand-3; RL-88; CO-1; T-9; Chetak
Bajra Napier Hybrid	IGFRI Hybrid Napier No.3; NB21
Guinea grass	Bundel Guinea-1; Bundel Guinea-2; PGG-14
Marvel grass	JHD-2013-2
Anjan grass	Bundel Anjan-1; Bundel Anjan-3

(Source: ICAR-IGFRI- Jhansi)

Technology on Value Added Products

Milk & Meat Products

Meat Litti

Chicken Litti

Balgrami

Flavoured Paneer

Paneer Pickle

Thekua

Millet Kheer

Soup

Lolly

Value-Added Fish Products and Processing Innovations

Fish Pickle: A flavorful, protein-rich preserved delicacy with enhanced shelf life and consumer appeal.

Procedure:

- Mix cut fish with 3% salt and keep for 2 hours for partial drying.
- Fry the fish in minimum oil and keep aside.
- Separately fry mustard, green chilli, garlic, and ginger.
- Add chilli powder, pepper, and turmeric; cook on low flame for a few minutes.
- Remove from heat, add fried fish, and mix well.
- After cooling, add vinegar, powdered cardamom, clove, cinnamon, sugar, and remaining salt; mix thoroughly.
- Pack in clean, sterile glass bottles with acid-proof caps, ensuring a thin oil layer on top.

Shelf life- 6 months.

Prawn Pickle: A premium prawn pickle enriched with spices, offering superior taste, nutrition, and extended storage stability.

Procedure:

- Wash, peel, and devein prawns (remove shell and intestine; collect meat only).
- Blanch in 1% boiling brine with 0.1% citric acid for 10 minutes **or** mix with 3% salt and partially sun-dry for 1–2 hours. Drain and weigh.
- Fry prawns in minimal oil at 180–190°C; keep aside.
- In the same oil, fry mustard, garlic, green chillies, and ginger until light brown.
- Add chilli and turmeric powders; cook on low flame.
- Add fried prawns and mix well.
- Add cinnamon, clove, asafoetida, and salt; mix thoroughly.
- Cool partially, then add vinegar and sorbate.
- Ensure pH is below 4 (check with pH paper).
- Cool completely, pack in bottles, and seal tightly.
- Keep at room temperature for a few days for maturation.

Shelf life - 6 months

Fish Chakli : A traditional crunchy snack redefined with fish protein for enhanced nutrition and taste.

Procedure: Clean and steam the fish, then mince it into a smooth paste. Dry in hot air iven and make fine powder.Mix the fish powder with gram flour, rice flour, chilli powder, turmeric, cumin, and salt. Knead into a firm dough, adjusting with a little water or flour if needed. Fill the greased chakli mould with the dough and press into spiral shapes.Deep fry on medium-low flame until golden and crispy. Drain excess oil, cool completely, and store in an airtight container.

Shelf life- 2- 3 months

Fish Namakpara: A crunchy, ready-to-eat snack fortified with fish protein and omega-3 fatty acids.

Procedure:

Clean, boil, and debone the fish. Mash it well to remove all bones, or dry it slightly in a hot air oven to reduce moisture. In a bowl, mix maida, sooji, rice flour, carom seeds, cumin, salt, turmeric, and chilli powder. Add the mashed fish and mix well. Add 2 tablespoons of oil and rub it into the mixture. Slowly add water and knead into a tight, firm dough. Cover and rest for 15–20 minutes. Roll the dough to medium thickness and cut into diamond or square shapes. Heat oil in a kadhai and fry on medium flame until golden brown and crisp. Drain excess oil on tissue paper. Cool completely and store in an airtight container. It stays crisp for 10–12 days.

Shelf life- 2- 3 months

Fish Surimi Ball: A soft, elastic, and protein-rich delicacy prepared from refined fish protein, offering superior texture and taste.

Procedure:

- Prepare washed fish mince (surimi) by repeatedly washing minced fish with chilled water and draining.
- Add salt (2–3%) and mix until sticky and elastic.
- Add sugar, starch, and seasoning, and mix well.
- Shape into balls and cook in hot water (80–90°C) until they float and become firm.
- Cool in chilled water and store under refrigeration.

Shelf life for frozen balls- upto 4 months

Fish Mince: Hygienically processed, deboned fish meat ideal for preparation of diverse value-added seafood products.

Procedure:

Clean and wash the fish thoroughly. Remove head, scales, skin, and bones carefully. Cut the fish into small pieces and mince it using a mincer to obtain a fine, uniform texture. If required, lightly steam or cook the mince to reduce moisture and improve texture. Allow it to cool. Use the fish mince immediately for preparing products like cutlets, balls, or nuggets, or pack it in clean, airtight pouches and store under refrigeration (0–4°C) for short-term use. For longer storage, freeze properly.

Shelf life under fridge temperature- 2 to 3 days

Fish Ball: A delicious, bite-sized, high-protein snack ideal for appetizers and party servings.

Procedure:

- Clean and debone the fish, then mince it finely.
- Mix the mince with salt, pepper, spices, ginger-garlic paste, and a little cornflour or egg for binding.
- Shape the mixture into small balls. Coat with breadcrumbs.
- Steam or deep fry until fully cooked and firm.
- Cool and store under refrigeration or serve hot.

Fish Cutlet: A soft, juicy, and protein-rich snack product suitable for quick serving and mass catering.

Procedure:

- Clean, cook, and debone the fish. Mash it well.
- Mix with boiled mashed potatoes, chopped onion, green chilli, coriander, spices, and salt.
- Shape into round or oval cutlets.
- Dip in beaten egg and coat with breadcrumbs.
- Shallow fry until golden brown. Serve hot.

Mahananda Gallery

Fish Species Displayed:

- A survey covering the total 324 km stretch of the Mahananda River was conducted by the College of Fisheries, Kishanganj.
- The survey area included districts of Kishanganj, Purnea, and Katihar in Bihar, as well as Darjeeling and Malda in West Bengal.
- During this survey, 57 fish species were recorded, and DNA barcoding was carried out for all the identified species.

Fig: Various survey locations of the Mahananda River

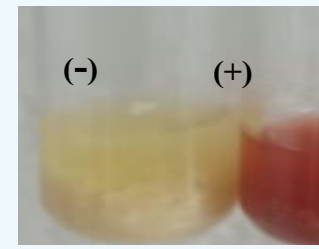
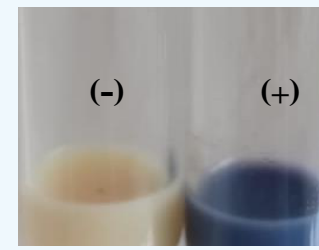
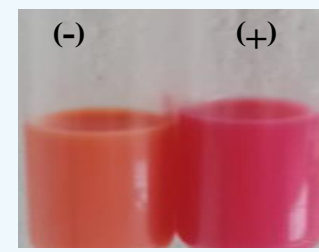
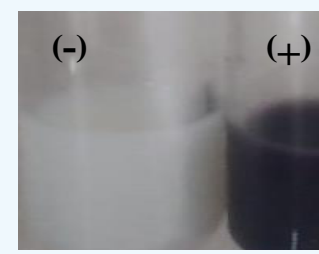
Milk Diagnostic Technology

Milk Adulteration Detection Kit

1. To earn extra profit, milk is often adulterated by adding cheaper substances or by removing valuable components.
2. To address this issue, the Sanjay Gandhi Institute of Dairy Technology (SGIDT), Bihar Animal Sciences University, Patna, has developed a milk adulteration detection kit.
3. The kit is designed to detect five major adulterants in milk: Starch, Sugar, Neutralizers, Urea and Hydrogen peroxide
4. The detection kit contains five specific chemical reagents, each meant for identifying a particular adulterant.
5. The testing procedure is simple, rapid, and cost-effective, requiring only a few millilitres of chemicals. Test results are obtained within a few minutes, making the kit suitable for quick and reliable milk quality assessment.
6. The kit can test up to 40 samples for each adulterant. The total cost of the kit is approximately Rs. 380/-, while the per-sample testing cost is around Rs. 1.90/-, making it highly economical.
7. The kit can be easily used by dairy farmers, entrepreneurs, milk vendors, quality control personnel, and even common consumers.
8. It is suitable for use at the farm level as well as for field-level applications.

Fig: Milk Adulteration Detection Kit

Procedure for Detection of Common Adulterants in Milk

Adulterant	Procedure	Result
Sugar	1ml milk in test tube+ 1ml Sugar detecting reagent. Mix the content and heat in boiling water for 5 min. Adulterated sample: Red colour Control sample: Light Yellow colour	
Starch	1 ml milk in test tube, Boil it and cool to room temperature. Add 2-3 drops of starch detecting reagent Adulterated sample: Blue colour Control sample: yellow colour	
Urea	1ml milk in test tube + 1ml Urea detecting reagent. Mix the content Adulterated sample: Deep Yellow colour Control sample: Light Yellow colour	
Neutralizer ($NaOH$, Na_2CO_3, $NaHCO_3$)	2 ml milk in test tube + 2 ml Neutralizers detecting reagent. Mix the content Adulterated sample: Red/Pink colour Control sample: Orange colour	
Hydrogen peroxide	1ml milk in test tube + 1ml Hydrogen peroxide detecting reagent. Mix the content Adulterated sample: Dark Blue colour Control sample: White colour	

Embryo Transfer Technology (ETT) Laboratory with IVF facility

An Embryo Transfer Technology (ETT) is an advanced reproductive biotechnology setup used in livestock for rapid genetic improvement, multiplication of elite animals, and conservation of superior germplasm. In simple words, one superior female can produce many calves in a year, instead of only one through natural breeding.

Objectives

- To produce embryos of genetically superior indigenous cattle breeds—Sahiwal, Bachaur, Gangatiri, and Red Sindhi—for field embryo transfer programs at farmers' doorsteps.
- To achieve rapid multiplication of elite indigenous cattle through embryo production using OPU–IVF technology.
- To produce elite bull calves and replacement heifers of Sahiwal, Bachaur, Gangatiri, and Red Sindhi breeds.
- To establish a comprehensive ETT- Laboratory with OPU–IVF–IVC facilities.

Achievements

- Construction of a new ETT and IVF- Laboratory in collaboration with the Government of Bihar and other stakeholders.
- Sahiwal, Bachaur, and Red Sindhi cows have been procured and established as donor animals.
- The conception rate achieved ranges between 25–30 percent.
- Till date, a total of 28 female calves have been born: 16 at farmers' fields through field embryo transfer and 12 at the farm itself.
- Approximately 30 animals are in line.

Benefit of ETT

➢ Accelerated genetic gain

- More number of progenies from elite donors
- Progenies from pre-pubertal heifers, cows with problem in reproductive tract
- Offspring from terminally ill/ injured cattle
- Efficient use of sexed semen
- Use multiple bulls in short period

Fig: Calves born through ETT

Fig: Embryo transfer at farmers doorstep

Ethno-veterinary Practices for various ailments in animals

Table: Disease-wise validated ethnoveterinary formulations used in field conditions

Name of ailment	Ingredients	Preparation	Application
Mastitis	Aloe vera pulp (250 g) Turmeric powder (50 g) Slaked lime (15 g) and Lemon (6 Nos)	Mix all ingredients to prepare uniform paste.	Apply externally on affected udder twice daily after milking for 3–5 days.
FMD – Mouth Lesions	Neem leaves (200 g) Turmeric (50 g) Coconut oil (100 ml)	Grind neem leaves; mix with turmeric and oil.	Apply gently on mouth lesions twice daily until healing.
FMD – Foot Lesions	Turmeric (50 g) Neem leaf paste (200 g) Sesame oil (100 ml)	Prepare paste by mixing all ingredients.	Apply on foot lesions after cleaning; twice daily.
Hygroma	Castor oil (100 ml) Turmeric (25 g)	Mix turmeric in warm castor oil.	Apply externally over swelling once daily for 5–7 days.
Bloat	Ginger (50 g) Garlic (50 g) Mustard oil (100 ml) Warm water (500 ml)	Crush ginger and garlic; mix with oil and dilute in warm water.	Administer orally once; repeat after 12 hours if required.
Diarrhoea	Pomegranate rind powder (100 g) Buttermilk (500 ml)	Mix powder thoroughly in buttermilk.	Administer orally twice daily for 2–3 days.
Retention of Placenta	Fenugreek seeds (100 g) Jaggery (200 g) Warm water (1 L)	Boil fenugreek; filter and mix with jaggery.	Administer orally once daily for 1–2 days.
Anestrus	Curry leaves (100 g) Fenugreek (50 g) Jaggery (200 g)	Grind ingredients; prepare bolus with jaggery.	Administer orally for 3 consecutive days.
Repeat Breeding	Drumstick leaves (200 g) Black gram flour (100 g) Jaggery (200 g)	Prepare bolus mixture.	Feed orally for 3–5 days before estrus.
Fever	Tulsi leaves (100 g) Black pepper (10 g) Ginger (25 g)	Crush and boil in 1 litre water; cool and filter.	Administer orally twice daily.
Worm Infestation	Neem leaves (200 g) Garlic (50 g)	Grind ingredients and mix in feed.	Administer orally once daily for 2 days.
Prolapse	Sugar (250 g) Turmeric solution (mild)	Prepare turmeric antiseptic solution.	Apply sugar locally to reduce swelling; clean with turmeric solution before reposition.
Indigestion	Ajwain (50 g) Ginger (25 g) Jaggery (100 g)	Crush and mix to prepare bolus.	Administer orally once daily for 2 days.
Lumpy Skin Disease (Supportive Care)	Neem leaves (500 g) Turmeric (50 g) Aloe vera pulp (200 g)	Prepare paste from ingredients.	Apply externally on nodules once daily.
Teat Obstruction	Warm castor oil (50 ml)	Warm slightly to body temperature.	Infuse gently into teat canal using sterile dropper.
Downer Animal (Supportive)	Jaggery (250 g) Mineral mixture (as available) Warm water	Dissolve jaggery and mineral mixture in water.	Administer orally once daily.

Source: NDDB

Name of ailment	Ingredients	Preparation	Application
Toxicity (Pesticide/HCN/ Mycotoxin – Supportive)	Activated charcoal (if available) Buttermilk (1 L)	Mix charcoal in buttermilk.	Administer immediately orally; seek veterinary care.
Ectoparasite Infestation (Ticks)	Neem leaves (500 g) Water (2 L)	Boil leaves for 20 minutes; cool and filter.	Use as body wash once daily for 3 days.
Venomous Sting/Bite (First Aid)	Turmeric (25 g) Lime (small quantity)	Prepare paste with water.	Apply over bite area; seek veterinary assistance.
Pox/Warts/Cracks	Turmeric (50 g) Coconut oil (100 ml)	Mix to prepare antiseptic paste.	Apply externally twice daily.
Udder Oedema	Musturd oil-200 ml Turmeric powder -1 handful handful, Garlic-2 pearls	Heat mustard oil, turmeric powder and Garlic pearls mix them and cool	Apply externally in circular manner 4 times daily until swelling subsides.

Source: NDDB

Mastitis (all types)

Repeat breeding

Retention of Placenta

FMD mouth lesions

Source: NDDB

Low-Cost Poultry Hatchery Unit

- This hatchery can be fabricated in thermocol box and also in plywood box with automatic temperature and humidity control. One 100 watt bulb for 100 eggs were used for maintaining temperature and one tray having water which vaporized after raising temperature and maintain the humidity of hatchery.

Fig: Low- cost hatchery unit

- Farmers marked eggs with dates and ensured regular incubation, enabling continuous hatching and steady income generation.
- Impact: Over 50 farmers across Banka district became small entrepreneurs, producing and selling improved chicks locally.

- Hatchery dimensions are 3 × 2 feet, with a capacity of 100 eggs, and the price is ₹1,500 per unit.

Portable bamboo cage for birds

Benefit:

Easy to clean, well ventilated, portable 3 storied bamboo cage (90x60x120 cm) which can be kept in sunlight or in shade/house with zero mortality recorded. It is recommended for poor farmers/ rural women/ rural youth for their secondary source of income.


Fig: Portable bamboo cage

Table : Economics of portable bamboo cage

Cost of Bamboo shelter house	No. of quail taken by landless women farmers	Cost on feed for next 3 week	Total expenditure	Net profit after 3 week old
Cost of bamboo: Rs. 300/- Cost of wire mesh, Nail and winding wire etc. : Rs. 100/- Labour cost : Nil (constructed by self) Total of Rs. 400/-	Rs. 15 per bird* = Rs. 15X 40 birds = 600/- (Two week old)	Rs. 525/- (for 35 birds @ Rs. 15X35 =525/- (5 birds gets died (approx.)	Rs. 600 +525 +100* (= 1,225/- (*divided cost of bamboo shelter: (400/4 = 100)	(selling price of 35 birds X @ Rs. 60 – =2100/- Net profit = 2100-1225 = 875/-

Digital Technology

BASU FEED – Animal Nutrition Mobile Application

- BASU FEED is a mobile-based animal nutrition application developed by Bihar Animal Sciences University (BASU), Patna to help livestock farmers provide scientifically balanced and quality feed to their animals. The app is user-friendly and designed to support informed feeding decisions for improved animal health and productivity.
- Farmers can easily download the application from the Google Play Store and use it to prepare customized feed rations based on the type, stage, and production status of their animals.

How to Install and use the BASU FEED App

1. Open the Google Play Store on your mobile phone and search for "BASU FEED".
2. Download and install the application, then select your preferred language (English or Hindi).
3. Register using your mobile number and complete OTP verification.
4. Enter your personal details and click on "Update Account".
5. Click on the "Animal" option in the app menu.
6. Select the type of animal to generate a feeding schedule.
7. Choose the physiological stage of the animal (calf, lactating, pregnant, or dry).
8. Enter required details such as milk yield, pregnancy duration, or physical activity level.
9. Based on the information provided, the app automatically generates a balanced feed ration.
10. The prepared feed report can be downloaded, viewed, or shared via WhatsApp.

Key Benefits of the BASU FEED App

- Provides scientific and balanced feeding recommendations
- Helps improve milk production and animal health
- Easy to use for farmers and field workers
- Supports digital advisory services in animal husbandry

Fig: BASU Feed App

Farmer App Bihar (Bihar Pashupalak Mobile App)

It is a digital platform developed by the Department of Animal and Fisheries Resources, Government of Bihar, for the benefit of livestock farmers. The app provides mobile-based access to animal health services, veterinary consultations, information on veterinary units, and government schemes, enabling livestock owners to receive support from their homes.

Key Features of the Mobile Apps

Doorstep Veterinary Services: Through the app, livestock owners can connect with veterinary doctors between 9:00 AM and 5:00 PM and avail telemedicine-based treatment and consultation for sick animals.

1962 Toll-Free Number: The app is integrated with the 1962 toll-free helpline, allowing livestock owners to request a veterinary ambulance or response team at their doorstep. The call centre is staffed with 04 experienced veterinarians and 12 call-centre executives. As per requirement, veterinary consultation can also be obtained through video calling, enabling coordination between veterinarians working in mobile veterinary units and veterinarians available at the call centre.

Animal Health and Management: The app provides information on animal health care, vaccination schedules, and breed improvement to promote scientific livestock management.

Information on Government Schemes: Regular updates on government subsidies and livestock-related welfare schemes are made available through the app.

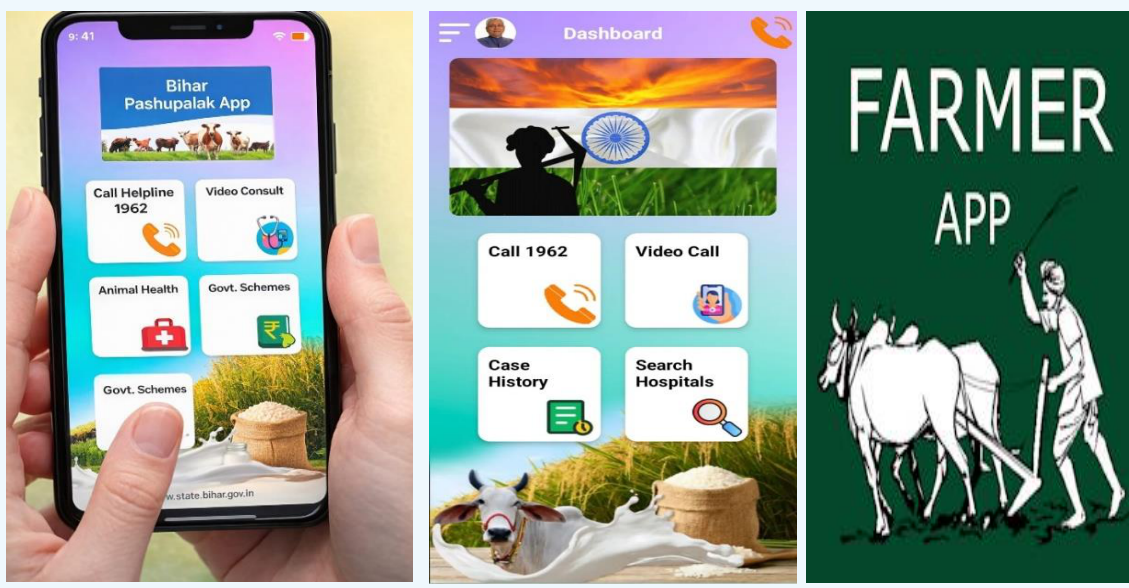


Fig: Bihar Pashupalak Mobile App

EXTENSION ACTIVITIES & SERVICES

Directorate of Extension Education (DEE)

The Directorate of Extension Education (DEE), Bihar Animal Sciences University (BASU), plays a key role in strengthening the livestock sector of Bihar. The main objective is to bridge the research–extension–farmer gap through farmer-centric dissemination of advanced livestock technologies.

KEY EXTENSION ACTIVITIES

1. Human Resource Development through Training Programs

Livestock Keepers | Veterinary professional | Para-vets| Rural Youth | Farm women

Short duration, long duration, vocational, skill development training programmes sponsored by different institutions are regularly organized both on-campus and off-campus for a diverse group of stakeholders, including farmers, livestock keepers, veterinary officers, dairy professionals, livestock assistants, and rural youth. Major thematic areas include:

- Scientific dairy farming and milk processing
- Veterinary diagnostic and therapeutic techniques
- Goat, poultry and goat farming management
- Fodder production and silage preparation
- Clean milk production practices
- Animal health management and vaccination protocols

Fig: TVO training program

2. Farm Science Centre (Krishi Vigyan Kendra Jamui)

- Directorate of Extension Education (DEE) at Bihar Animal Sciences University (BASU), Patna is instrumental in establishing KVK, extending the university's presence and outreach in tribal and underdeveloped regions.
- KVK regularly conducts Frontline Demonstrations (FLDs), On-Farm Trials (OFTs) and training programmes to evaluate and popularize livestock technologies across farming systems.
- KVK has dedicated units for goat, poultry, pig, and cattle rearing, offering vital hands-on training and experiential learning opportunities to farmers, students, and extension workers. A nursery demonstration unit has been set up to promote horticultural practices and plant propagation techniques. Two functional borewells have been installed to ensure a reliable water supply for farm operations and irrigation needs. Furthermore, a farm implement shed has been constructed to house agricultural tools and machinery, enabling mechanized demonstrations and equipment familiarization.
- To provide continuous support and advisory services to the farming community, a Kisan Paramarsh Kendra (Farmers' Advisory Centre) has been established.
- Moreover, a seed production unit has been initiated to facilitate the production and distribution of quality seeds.

3. IEC Activities (Information Education Communication)

Content Mobilisation through Pashupalan Darshika

- Quarterly hindi magazine for farmers and other stakeholders
- Document best practices, Success stories
- Seasonal advisories and thematic area-wise issues
- Scientific guidance in local language

Publication and Distribution of Extension Literature

- Publishes leaflets, booklets, manuals, and newsletters in regional languages for easy understanding.
- Topics include disease management, fodder production, breeding techniques, and value-added dairy products.

Audio-Visual Aids

- Produces educational videos and slide presentations on animal husbandry practices.
- Broadcasts programs through Doordarshan, All India Radio, and local cable networks.

Use of ICT Tools

- Provides information through mobile apps, SMS services, and WhatsApp groups.
- Maintains an online knowledge updates on livestock management at university website.

4. Digital Extension

e-Kisan Samadhan

- WhatsApp-based digital advisory
- Real-time expert solutions
- Weather & disease alerts
- Two-way farmer
- Audio-video based solution

Online Advisory Services through WhatsApp group

- Web based digital advisory
- Covers animal production, animal health, agriculture and fisheries sectors

5. Village-Centric Extension Programme

Farmer FIRST Project (Farm, Innovations, Resources, Science and Technology)

- Sidhauli & Senduari Villages, Vaishali
- Farmer centric participatory program Integrated Crop–Livestock Approach
- Strengthening rural livelihoods

Village Adoption Program

- Dariyapur village, Naubatpur, Patna
- Strengthening of Dairy & Poultry enterprise

6. Public Outreach (Exhibitions, Fairs & Events)

Organisation of Livestock and Agriculture Fairs (Pashu Melas)

- To showcase of latest livestock breeds, modern technologies, and best management practices.
- Offers platform for farmers to interact with scientists and companies.

Participation in State/National Exhibitions

- Representation in regional and national agri expos and fairs
- Demonstrates university innovations and farmer success stories.

Cattle EXPO in PPP Mode

- Breed identification & recognition
- Showcasing of Livestock technologies
- Networking with various stake holders Farmer–Scientist interaction

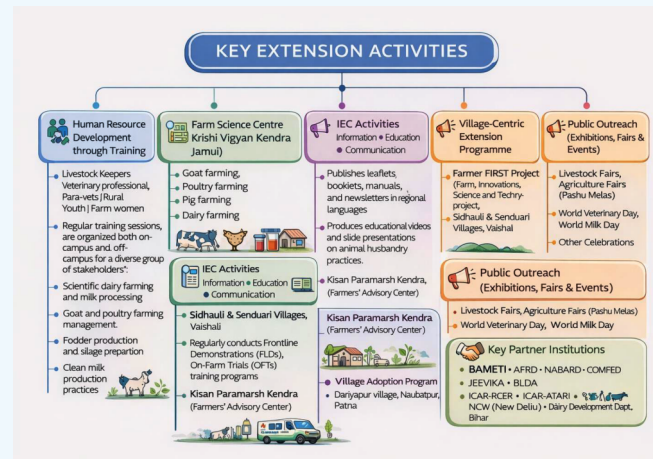
Organisation of Dog, Cat and Goat Show

- Showcase quality breeds as per recognized breed standards.
- Provide exposure to pet product manufacturers and service providers.

Organisation of Industry-Academia Interface Meet

Awareness Rallies & Campaigns

World Veterinary Day, World Milk Day, and Other Celebrations



- Organizes events to spread awareness on livestock health, nutrition, and productivity.
- Zoonotic disease awareness (Rabies, Brucellosis, etc.)
- Anti-cruelty campaigns
- Biosecurity and disease prevention drives
- Involves school children, farmers, and stakeholders for community participation.

7. Collaboration & Networking

BAMETI /DAFRD /NABARD/COMFED/JEEViKA/BLDA/ICAR-RCER/ICAR-ATARI/NCW (New Delhi)/Dairy Development Dept., Bihar

Extension on Wheels: Krishi Gyan Vahan

This vehicle was launched under the 4th Agricultural Road Map of the Department of Agriculture, Govt. of Bihar. Providing agricultural information and solutions directly to farmers' doorsteps.

The Agricultural Knowledge Vehicle has been developed with the special objective of providing the latest information and necessary facilities related to animal sectors. The vehicle is equipped with audio-visual aids, diagnostic kits & medicines door step delivery and advisory services. Extension outreach through extension material. The Krishi Gyan Vahan showcased various informative videos on feeding, breeding, healthcare, and management aspects of livestock, which were well-received by the farmers.

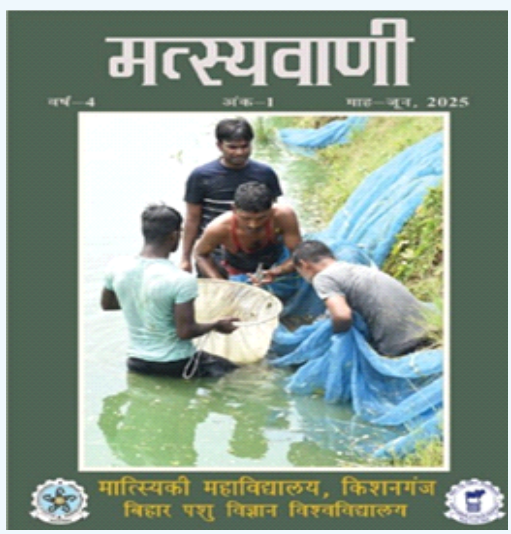
Features

- Providing animal health services at farmers doorstep and inbuilt with diagnostic facilites.
- On-the-spot resolution of livestock-related problems faced by farmers.
- Solutions to practical problems related to agriculture and allied sectors.
- Identification and management guidance for pests and diseases affecting food crops and other crops.
- Farmer awareness and capacity building through audio-visual media provided by universities.
- Encouraging rural youth towards self-employment opportunities.
- Availability of agricultural inputs such as seeds, bio-fertilizers, liquid bio-fertilizers, vermicompost, etc.
- Creating awareness among farmers about public welfare government schemes.
- Farmers education through extension literatures.
- Demonstration of modern livestock technologies for enhancing farmers' knowledge and income

Fig: Activities of BASU Krishi Gyan Vahan at farmers doorstep

Fisheries Extension Activities

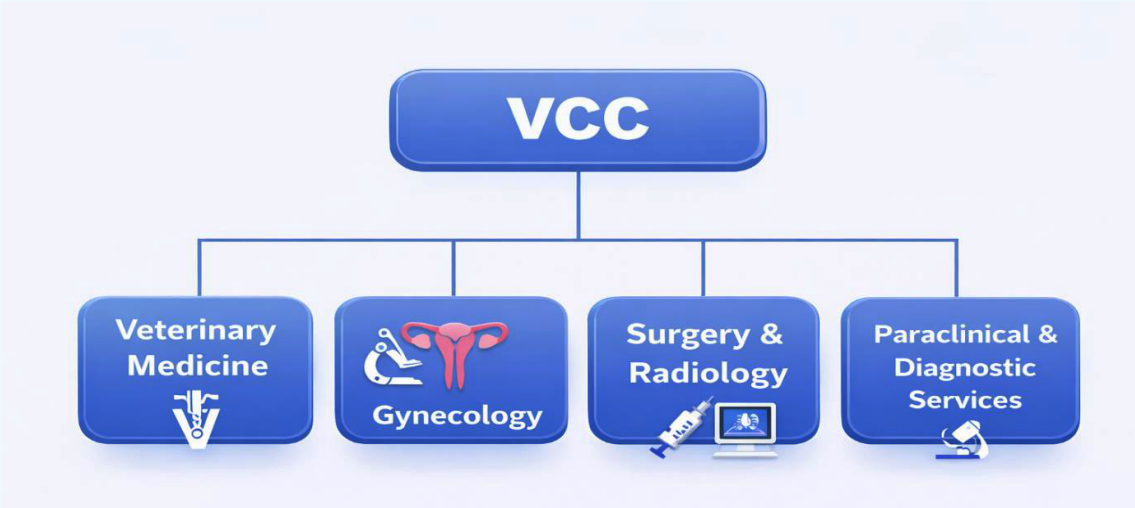
S.No	Type of Activity	Description
1	Capacity Building through Training Programmes	College of KIsanganj organizes training for fish farmers, youth of Bihar, in thefield of Aquaculture, Fish Processing, Fish Diseaseetc.These training are sponsored by Directorate of Fisheries, Govt. of Bihar, different ATAM agencies and NGOs.
2	Village Adoption Programme (Matsay Gram)	College has adopted two villages namely " Khaanbadi" with the objective to aware the farmers regarding "Fish cum Shrimp culture practices" and "Kharrabel baari" with the objective of "Promoting Scientific Fish Farming Practices."
3	Digital Extension (E-Samadhan)	An online initiative of "E-samadhan" to solve the problems of fish farmers in real time. This program is organized on every 2 and 4 Saturday of every month.
4	Online Advisory (Bihar Matsya Sampada)	A Whatsapp group named "Bihar Matsya Sampada" is operational for fish farmers for advisories and real time problem solution.
5	Public Outreach	To raise the awareness among the fish farmers, important days like Nation Fish Farmers Day, World Soil Day etc. organized at at farmers doorstep.
6	Content Mobilization (Matsyavaani magazine)	Publication of biannual Hindi magazine for fish farmers. The topics are related to fisheries sector.
7	Publication of other Extension literature	Publishes of extension literatures in local language and distributed it among farmers to raise the awareness regarding fish farming activities.
8	Participation in Kisan Mela	Time to time college participate in different extension activities (Kisan Melaa, Dairy and Cattel Expo.) by displaying the college stall.

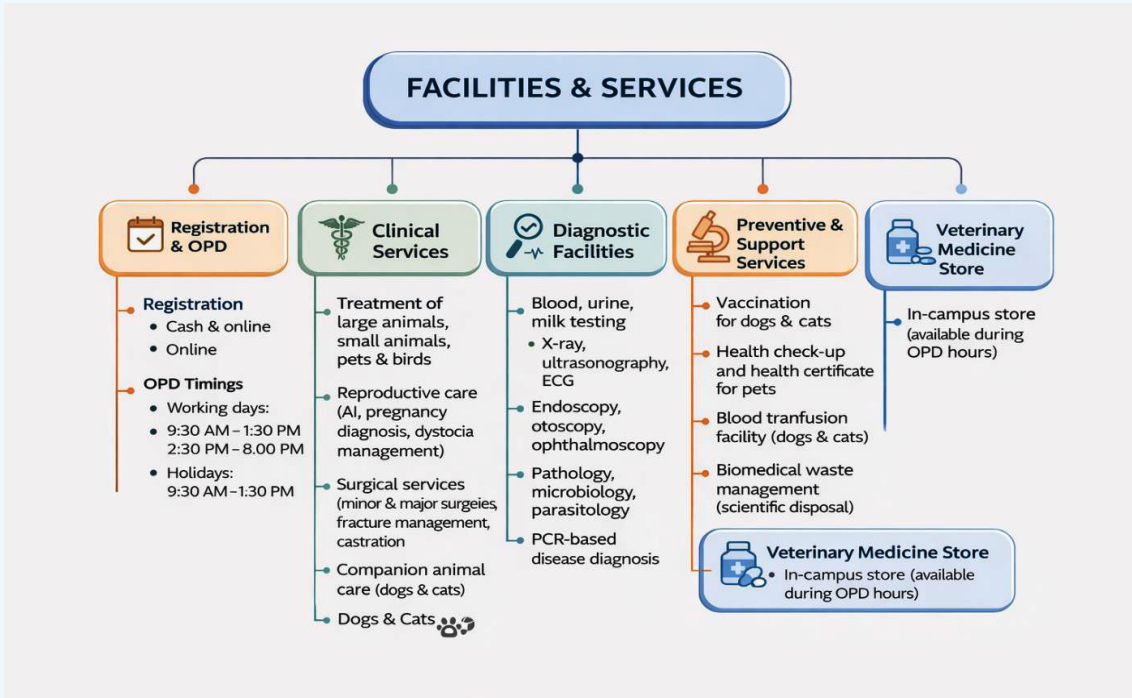


VETERINARY CLINICAL SERVICES

Veterinary Clinical Complex (VCC)

- The Veterinary Clinical Complex (VCC) provides comprehensive animal health care services along with hands-on clinical training for undergraduate and postgraduate veterinary students. Services are available 365 days a year for farmers, livestock owners, and pet owners.
- Nearly 20,000 animals are treated annually.





Detailed description of Facilities Available at the Veterinary Clinical Complex

1. Registration Counter

For the treatment of any animal, first of all the animal is registered at this counter. Through this, a registration slip/token is prepared for referral to the concerned Outdoor Patient Department (OPD) for the animal's treatment. The animal owner then takes this slip and gets the animal treated in the respective OPD.

The registration fee can be paid both in cash and online. The treatment charges and the fees for various services available for different animals are publicly displayed at the registration counter.

Fig: Registration counter

OPD Timings

OPD Section	Normal Hours	Emergency Hours
Working Days	9:30 AM – 1:30 PM	2:00 PM – 8:00 PM
Holidays	9.30 AM – 1.30 PM	-

2. Veterinary Medicine Store (Pharmacy)

There is a veterinary medicine store available within the Veterinary Clinical Complex itself, from where animal owners and pet owners can purchase medicines for the treatment of their animals. This store is located to the south of the Registration Counter.

The OPD (Out Patient Department) and the medicine store remain open from 9:30 AM to 8:00 PM on working days, and on holidays from 9:30 AM to 1:30 PM.

Fig: Veterinary pharmacy

3. Veterinary Medicine OPD (Out Patient Department)

This department is located to the north of the Registration Counter. Here, both small and large animals are mainly treated with medicines (medical treatment).


Fig: Veterinary medicine OPD

4. Veterinary Surgery and Radiology OPD (Out Patient Department)

This department is located exactly to the north of the Veterinary Medicine OPD. Here, animals are mainly treated through surgical procedures, such as:

- Treatment of broken/fractured bones
- Dressing of wounds
- Suturing (stitching) of wounds
- Gastrointestinal Surgery
- Other surgical operations
- Facilities for radiology (X-ray, USG etc.) are also available here.

Fig: Veterinary surgery OPD

5. Veterinary Obstetrics & Gynecology OPD ((Out Patient Department)

This department is located exactly to the north of the Veterinary Surgery and Radiology OPD. Here, reproductive disorders of both large and small animals are mainly treated.

Fig: Veterinary gynecology OPD

6. Vaccination Centre

This centre is located at the extreme northern side of the Veterinary Clinical Complex, so that healthy animals coming for vaccination do not come into contact with sick animals. Vaccination facilities for dogs and cats are available here.

7. Physiotherapy Unit

This unit is located at the extreme northern side of the Veterinary Clinical Complex, adjacent to the Vaccination Center on the eastern side. Here, all animals are treated through physiotherapy methods (rehabilitation therapy).

8. Large Animal OPD (Outpatient Department for Large Animals)

This department is located at the extreme northern side of the Veterinary Clinical Complex, adjacent to the Vaccination Center on the western side. Here, treatment facilities are available for all large animals such as cows, buffaloes, horses, etc., and arrangements are also available for their stay (housing/holding).

Fig: Large animal OPD

9. Biomedical Waste Disposal Facility

The Veterinary Clinical Complex is registered under the Biomedical Waste Management System. Through this system, the biomedical waste generated here is disposed of using scientific methods.

Fig: Biomedical waste disposal

10. Diagnostic Centre

Facilities are available here for testing animals' blood, urine, milk, and other samples. Various types of modern diagnostic equipment are available here, such as:

- X-ray
- Ultrasound
- ECG (Electrocardiography)
- Endoscope
- Ophthalmoscope
- Autoclave
- and other instruments

A detailed description of the various services available at the VCS is provided below.

Fig: Diagnostic Lab

1. Obstetrics & Gynecology Services

- Artificial insemination in cows, buffaloes, and goats
- Removal of retained placenta
- Treatment of uterine prolapse
- Management of dystocia (difficult birth) in farm and companion animals
- Pregnancy diagnosis in cows and buffaloes
- Pregnancy diagnosis in pet animals using USG (ultrasound) and X-ray
- Semen motility and evaluation tests in animals
- Vaginal cytology
- Cesarean section in companion animals
- Ovariohysterectomy (spaying) in companion animals
- Surgery for vaginal hyperplasia/TVH in dogs and cats
- **2. Surgical Services**

All types of minor and major surgeries in farm and companion animals

- Dehorning (disbudding) in calves
- Application of plaster casts in all farm and companion animals
- Stringhalt surgery in large animals
- Dermoid cyst surgery
- Laparoscopic surgery in dogs and cats
- Fracture management in all animals
- Dental scaling and extraction in dogs and cats
- Wound management
- Castration of all animals
- Teat and udder (teat/udder

Fig: Clinical services at BVC, BASU- Patna

LABORATORY DIAGONIS SERVICES

1. Pathological Investigations

- Post-mortem examination of all animals
- Biopsy (FNAC – Fine Needle Aspiration Cytology)
- Histopathological examination
- All types of blood tests
- Routine urine examination
- Test for Mastitis

2. Microbiology Culture & Sensitivity Tests

PCR-based Diagnosis

- Semen sample testing for IBR (Infectious Bovine Rhinotracheitis)
- Semen sample testing for Blue Tongue
- Rabies testing
- Foot-and-Mouth Disease (FMD)
- PCR tests
- Brucellosis
- Tuberculosis (TB)
- Johne's Disease (JD)
- Listeriosis
- Tests for Theileriosis and Babesiosis

3. Parasitological Examinations

- Blood parasite examination in all animals
- Fecal and urine examination in all animals
- Skin and nasal scraping examination in all animals

4. Biochemical & Imaging Investigations (for all animals)

- X-ray of all animals
- Ultrasonography (USG) of all animals
- ECG of all animals
- Endoscopy
- Otoscopy
- Ophthalmoscopy

5. Additional Facilities

- Health check-up of pet animals
- Health certificates for pet animals
- Laser therapy for all animals
- Blood transfusion facility for small and large animals

Fig: Clinical and diagnostic services at BVC, BASU- Patna

POLICY INSIGHT

Breeding Strategies

- **Major Challenges**
- High proportion of non-descript and low genetic merit animals.
- Inadequate coverage and uneven quality of Artificial Insemination (AI) services, especially in remote areas. Coverage of artificial insemination is low (16%)
- Efficiency of artificial insemination is low (No. of AIs needed (2.5 AI /conception)
- Limited availability of quality semen of proven indigenous and high-yielding bulls.
- Poor heat detection and timing of AI, leading to low conception rates.
- Larger proportion of unregistered and untrained livestock technicians.
- Not well aligned incentive system to the technicians and farmers.
- Lack of field-level performance recording and progeny testing systems.
- Absence of a robust animal identification and traceability system.
- Weak enforcement of breeding policies and unregulated breeding practices.
- Limited awareness among farmers about breed suitability and genetic improvement strategies.
- **Strategies**
- Implement breed conservation and genetic improvement programs for native breeds.
- Promote Sahiwal, Red Sindhi, and Murrah breeds to enhance milk production in Bihar.
- Promote grading-up of low-producing non-descript animals through structured breeding programs.
- Expand Artificial Insemination (AI) coverage using quality semen from proven indigenous and high-yielding crossbred bulls.
- Ensure careful identification of reliable sources for quality bulls and semen doses.
- Make pedigree information of breeding bulls transparent and accessible to farmers.
- Implement a robust animal identification system to record ownership, pedigree, breed composition, and breeding history.
- Ensure uninterrupted availability of breed-specific semen doses for designated clusters to all AI technicians.
- Register AI technicians only after training, policy orientation, and proficiency assessment.
- Provide natural service bulls in areas where AI services are not currently feasible.
- Initiate field-level performance recording systems to monitor outcomes and assess breeding policy impact.
- Actively involve farmers in the planning and implementation of breeding programs.

Feeding Strategies

Major Challenges

- Limited adoption of scientific feeding and balanced ration practices.
- Low awareness and use of mineral mixture and concentrate supplementation.
- High cost and inconsistent quality of commercial feed and fodder.
- Chronic shortage of green fodder, particularly during lean seasons.
- Meagre area under fodder crops and shortages of quality fodder seeds
- Competition between commercial crops (eg grain, pulses, oilseed, vegetable production) and fodder crops.
- Over grazing of pastures, community grazing resources and over lapping of fodder trees and bushes
- Poor access to quality fodder seeds and planting material.
- Inadequate feed testing and quality assurance mechanisms.
- Under utilization of crop residues and rice fallow areas for fodder production.

Strategies

- Promote balanced ration feeding through ration balancing advisory services.
- Promote area-specific mineral mixture and UMMB.
- Identification of areas for fodder cultivation in rice fallows and common lands.
- Creating awareness among farmers/stakeholders for cultivation of fodder crops
- Providing package of practices (PoP) for fodder crops
- Adoption of holistic approach - fodder production, conservation and utilization
- Conservation of forage resources like hay and silage to mitigate calamities and ease of transport
- Strengthen feed testing laboratories for quality assurance.
- Support livestock feed entrepreneurship for rural youth and SHGs.
- Public-Private-Partnership (PPP) mode of operation

Health Management Strategies

Major Challenges

- High prevalence of infectious and parasitic diseases affecting productivity.
- Inadequate preventive healthcare and vaccination coverage.
- Limited availability of diagnostic facilities, particularly advanced and field-based diagnostics.
- Shortage of trained veterinarians, para-vets, and support staff.
- Weak disease surveillance, reporting, and early warning systems.
- Poor biosecurity, hygiene, and farm-level disease management practices.
- Limited availability and timely supply of quality veterinary medicines and vaccines.

Strategies

- Strengthen preventive healthcare through regular vaccination programs (FMD, HS, BQ, PPR, Brucellosis).
- Regular deworming and vaccination schedule should be followed
- Proper housing management practices should be followed (Direction, Cleaning and Sanitization)
- Routine dairy farm operation should be followed strictly
- Promote bio-security measures and scientific waste management.
- Proper care and management practices should be followed during extreme hot and cold weather situation
- Strengthen disease diagnosis and infertility management services.
- Encourage use of periodic health camps in rural areas.
- Proper management practices should be followed during flood/draught/fire/thunder storms situation.
- Improve disease surveillance, early warning, and reporting systems.
- Enhance diagnostic infrastructure, including PCR-based disease diagnosis.
- Upgrade veterinary hospitals, dispensaries, and mobile veterinary units.
- Ensure availability of essential veterinary drugs and medicines at affordable prices.

Extension & Institutional Strategies

Major Challenges

- Inadequate farmer-centric and need-based extension services.
- Limited reach of extension programs among smallholders, women, and marginal farmers.
- Lack of coordination among line departments, universities, KVKs, and private stakeholders.
- Low adoption of ICT-based advisory services due to digital divide and limited digital literacy.
- Insufficient hands-on training, demonstrations, and exposure visits.
- Weak feedback mechanisms between farmers, researchers, and policymakers.
- Limited focus on youth engagement and livestock entrepreneurship development.

Strategies

- Strengthen training programs for farmers, para-vets, and extension workers.
- Promote village-centric extension models such as Farmer FIRST and Village Adoption Programs.
- Use ICT-based extension tools (mobile apps, WhatsApp advisories, SMS alerts).
- Strengthen Krishi Vigyan Kendras (KVKs) for frontline demonstrations and on-farm trials.
- Promote women and youth-centric livestock entrepreneurship.
- Organize livestock fairs, expos, and awareness campaigns for technology dissemination.
- Strengthen milk procurement, cold chain, and processing infrastructure.
- Promote producer institutions, cooperatives, and FPOs in livestock sector.
- Encourage public–private partnerships (PPP) for breeding, health, and marketing services.
- Facilitate credit, insurance, and risk-mitigation schemes for livestock farmers.
- Establish a Regulatory Authority/Livestock Extension Mechanism to oversee farmer education, service provider registration, quality control of AI services, and enforcement and periodic review of breeding policies.

Fisheries Sector

Major Challenges

- Dependence on external fish seed supply.
- Local hatcheries still struggle to provide high-quality fish seed at scale, forcing farmers to source seed from other states.
- Environmental & resource challenges such as; siltation sedimentation and water, pollution and open access fisheries in rivers lead to overfishing and stock depletion reduce water-holding capacity of ponds and chaurs.
- Knowledge & skill gaps in scientific aqua-culture practices, water quality management, disease control, and efficient feeding.
- Natural hazards like; flooding in north Bihar damages ponds, washes away fish stock, and disrupts production cycles.
- Market & value chain limitations

Strategies

- Strengthen seed production & genetic quality
- Invest in certified, high-quality brood banks and hatcheries with public-private collaboration.
- Provide incentives for private hatchery expansion and quality assurance systems.
- Expand capacity building & extension services to scale up aquaculture technologies and business management.
- Partner with research institutes for continuous skill upgradation.
- Promote sustainable & climate-resilient practices such as integrated aquaculture models.
- Implement ecosystem-based management for wetlands and reservoirs — balancing production and conservation.
- Develop market infrastructure & value chains such as cold chains, processing units, and auction hubs to reduce wastage and improve prices.
- Strengthen producer organizations to improve bargaining power and link to larger markets.
- Boost technology adoption by use of modern systems like Biofloc, RAS, cage and pen culture, tailored to local contexts.
- Facilitate access to finance & insurance
- Foster export-oriented growth

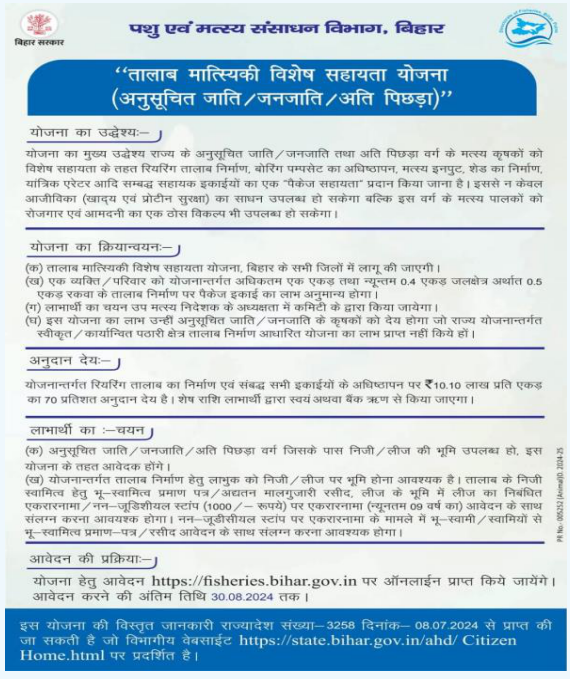
Recommended State Government Schemes

S.No.	Name of Scheme	Key Components
1	**Desi Gaupalan Protsahan Yojana** (Indigenous Cow Promotion Scheme)	**Objective:** Promote rearing of indigenous cattle breeds, improving rural livelihoods and income. **Subsidy Range:** Beneficiaries may receive 40–75% subsidy on setting up dairy farms with indigenous cows, covering purchase of cows and related infrastructure. **Target Groups:** Includes small/marginal farmers, landless livestock keepers, unemployed youth, women, and others. **Impact:** Helps preserve indigenous breeds while generating employment and income.
2	**Samagra Gavy Vikas Yojana** (Comprehensive Dairy Development)	**Objective:** Promote dairy farming and milk production by supporting farmers to set up dairy units with high-yielding milch animals. **Subsidy Benefits:** 75% subsidy for EBC, SC & ST farmers for small units (2–4 animals),50% subsidy for other farmers for small units (2–4 animals), 40% subsidy for all categories for larger units (15–20 animals) **Eligibility:** All interested farmers and entrepreneurs in Bihar who wish to start a dairy unit. **Application:** Can be applied online through the Dairy Development Directorate's portal.
3	**Samagra Bhains Palan Yojana** (Comprehensive Buffalo Rearing Scheme)	**Objective:** Promote 1 or 2 high-yielding dairy buffaloes (such as; Murrah, Jaffrabadi, Bhadawari) can be purchased with government subsidy. **Subsidy rates depend on beneficiary category:** 75% subsidy for Extremely Backward Class (EBC), SC, and ST categories 50% subsidy for other categories.
4	**Pashu Bima Yojana** (Livestock Insurance)	**Purpose:** Provide financial protection to dairy cattle against disease and mortality. **Coverage:** Each milch animal can be insured up to ₹60,000. **Premium Subsidy:** State government covers 75% of the insurance premium, significantly lowering the cost for farmers; the remaining 25% is farmer's share. **Benefits:** Compensation paid in case the insured cattle dies due to eligible causes including diseases like Lumpy Skin Disease and HS. **Implementation:** Through the Directorate of Dairy Development, Govt. of Bihar.

S.No.	Name of Scheme	Key Components
5	**National Livestock Mission – Entrepreneurship Development Program**(NLM-EDP)	**Focus:** Encourages entrepreneurship and livestock enterprise development under the National Livestock Mission with support from the state. • Poultry, sheep, goat, and piggery enterprises. • Feed and fodder development. Small-ruminant and rural poultry breed improvement. • Capital subsidies for eligible individuals, FPOs, SHGs, JLGs, and other groups to start livestock-based businesses. • Skill development for state officials and livestock farmers to improve extension delivery and productivity
6	**Animal Husbandry Infrastructure Development Fund** (AHIDF)	**Overview:** The Bihar government has approved large-scale infrastructure investments (e.g., projects worth ₹839 crore) to modernize veterinary, dairy, and fisheries infrastructure. **Components:** New veterinary hospitals, training centres, dairy processing units, and fish markets. **Impact:** Aims to build capacity for technology dissemination, farmer training, and value-addition facilities in livestock and allied sectors

(Source: DFARD, Govt. of Bihar)

S.No.	Name of Scheme	Key Components
1	**Chief Minister's Pond Fisheries Development Scheme**	Pond construction/renovation, aerators, pump sets, hatchery support 50–70% subsidy.
2	**Indigenous Fish Farming Scheme**	Minor carp & catfish hatchery and rearing units Up to 60% subsidy.
3	**Bhraman Darshan Program (Exposure Visit)**	Training & exposure visits to successful fish farms Fully/partially funded training
4	**Boat & Net Subsidy Scheme**	Supply of boats and fishing nets Up to 90% subsidy
5	**Mukhyamantri Machhua Kalyan Yojana**	Three-wheeler with ice box, fishing kits 50% subsidy
6	**SC/ST Pond Construction Scheme**	New pond construction for aquaculture Up to 80% subsidy
7	**Wetland/Chaur Development Scheme**	Development of low-lying lands & wetlands for fish culture 50–70% subsidy
8	**Skill Development & Technology Promotion**	Training in biofloc, RAS, modern aquaculture Training support/subsidy



बिहार सरकार

पशु एवं मत्स्य संसाधन विभाग, बिहार

"तालाब मात्स्यिकी विशेष सहायता योजना (अनुसूचित जाति/जनजाति/अति पिछड़ा)"

योजना का उद्देश्यः–

योजना का मुख्य उद्देश्य राज्य के अनुसूचित जाति/जनजाति तथा अति पिछड़ा वर्ग के मत्स्य कृषकों को विशेष सहायता के तहत रियरिंग तालाब निर्माण, बोरिंग पम्पसेट का अधिष्ठापन, मत्स्य इनपुट, शेड का निर्माण, यांत्रिक एरेटर आदि सम्बद्ध सहायक इकाईयों का एक "पैकेज सहायता" प्रदान किया जाना है। इससे न केवल आजीविका (खाद्य एवं प्रोटीन सुरक्षा) का साधन उपलब्ध हो सकेगा बल्कि इस वर्ग के मत्स्य पालकों को रोजगार एवं आमदनी का एक ठोस विकल्प भी उपलब्ध हो सकेगा।

योजना का क्रियान्वयनः–

(क) तालाब मात्स्यिकी विशेष सहायता योजना, बिहार के सभी जिलों में लागू की जाएगी।
(ख) एक व्यक्ति/परिवार को योजनान्तर्गत अधिकतम एक एकड़ तथा न्यूनतम 0.4 एकड़ जलक्षेत्र अर्थात 0.5 एकड़ रकबा के तालाब निर्माण पर पैकेज इकाई का लाभ अनुमान्य होगा।
(ग) लाभार्थी का चयन उप मत्स्य निदेशक के अध्यक्षता में कमिटी के द्वारा किया जायेगा।
(घ) इस योजना का लाभ उन्हीं अनुसूचित जाति/जनजाति के कृषकों को देय होगा जो राज्य योजनान्तर्गत स्वीकृत/कार्यान्वित पठारी क्षेत्र तालाब निर्माण आधारित योजना का लाभ प्राप्त नहीं किये हों।

अनुदान देयः–

योजनान्तर्गत रियरिंग तालाब का निर्माण एवं संबद्ध सभी इकाईयों के अधिष्ठापन पर ₹10.10 लाख प्रति एकड़ का 70 प्रतिशत अनुदान देय है। शेष राशि लाभार्थी द्वारा स्वयं अथवा बैंक ऋण से किया जाएगा।

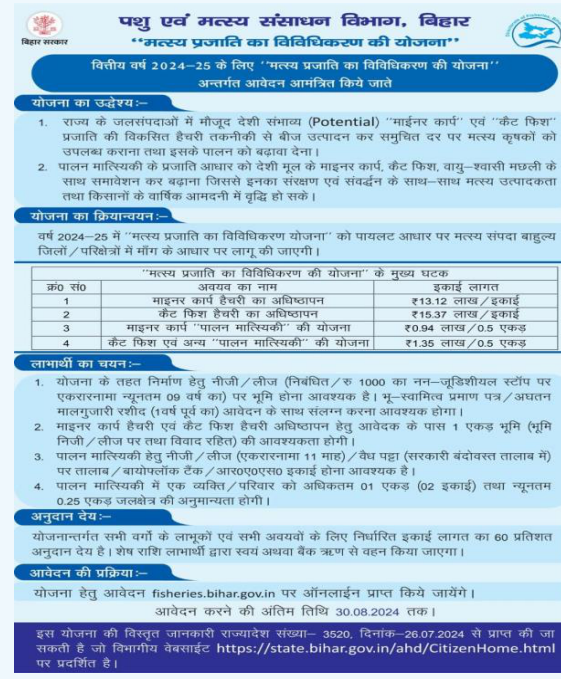
लाभार्थी का :–चयन

(क) अनुसूचित जाति/जनजाति/अति पिछड़ा वर्ग जिसके पास निजी/लीज की भूमि उपलब्ध हो, इस योजना के तहत आवेदक होंगे।
(ख) योजनान्तर्गत तालाब निर्माण हेतु लाभुक को निजी/लीज पर भूमि होना आवश्यक है। तालाब के निजी स्वामित्व हेतु भू–स्वामित्व प्रमाण पत्र/अद्यतन मालगुजारी रसीद, लीज के भूमि में लीज का निबंधित एकरारनामा/नन–जूडिशीयल स्टांप (1000/– रूपये) पर एकरारनामा (न्यूनतम 09 वर्ष का) आवेदन के साथ संलग्न करना आवश्यक होगा। नन–जूडीसीयल स्टांप पर एकरारनामा के मामले में भू–स्वामी/स्वामियों से भू–स्वामित्व प्रमाण–पत्र/रसीद आवेदन के साथ संलग्न करना आवश्यक होगा।

आवेदन की प्रक्रियाः–

योजना हेतु आवेदन https://fisheries.bihar.gov.in पर ऑनलाईन प्राप्त किये जायेंगे। आवेदन करने की अंतिम तिथि 30.08.2024 तक।

इस योजना की विस्तृत जानकारी राज्यादेश संख्या–3258 दिनांक– 08.07.2024 से प्राप्त की जा सकती है जो विभागीय वेबसाईट https://state.bihar.gov.in/ahd/ Citizen Home.html पर प्रदर्शित है।



बिहार सरकार

पशु एवं मत्स्य संसाधन विभाग, बिहार

"मत्स्य प्रजाति का विविधिकरण की योजना"

वित्तीय वर्ष 2024–25 के लिए "मत्स्य प्रजाति का विविधिकरण की योजना" अन्तर्गत आवेदन आमंत्रित किये जाते

योजना का उद्देश्यः–

1. राज्य के जलसंपदाओं में मौजूद देशी संभाव्य (Potential) "माईनर कार्प" एवं "कैट फिश" प्रजाति की विकसित हेचरी तकनीकी से बीज उत्पादन कर समुचित दर पर मत्स्य कृषकों को उपलब्ध कराना तथा इसके पालन को बढ़ावा देना।
2. पालन मात्स्यिकी के प्रजाति आधार को देशी मूल के माइनर कार्प, कैट फिश, वायु–श्वासी मछली के साथ समावेशन कर बढ़ाना जिससे इनका संरक्षण एवं संवर्द्धन के साथ–साथ मत्स्य उत्पादकता तथा किसानों के वार्षिक आमदनी में वृद्धि हो सके।

योजना का क्रियान्वयनः–

वर्ष 2024–25 में "मत्स्य प्रजाति का विविधिकरण योजना" को पायलट आधार पर मत्स्य संपदा बाहुल्य जिलों/परिक्षेत्रों में मांग के आधार पर लागू की जाएगी।

"मत्स्य प्रजाति का विविधिकरण की योजना" के मुख्य घटक

क्र0 सं0	अवयव का नाम	इकाई लागत
1	माइनर कार्प हेचरी का अधिष्ठापन	₹13.12 लाख/इकाई
2	कैट फिश हेचरी का अधिष्ठापन	₹15.37 लाख/इकाई
3	माइनर कार्प "पालन मात्स्यिकी" की योजना	₹0.94 लाख/0.5 एकड़
4	कैट फिश एवं अन्य "पालन मात्स्यिकी" की योजना	₹1.35 लाख/0.5 एकड़

लाभार्थी का चयनः–

1. योजना के तहत निर्माण हेतु नीजी/लीज (निबंधित/रु 1000 का नन–जूडिशीयल स्टॉप पर एकरारनामा न्यूनतम 09 वर्ष का) पर भूमि होना आवश्यक है। भू–स्वामित्व प्रमाण पत्र/अधतन मालगुजारी रशीद (1वर्ष पूर्व का) आवेदन के साथ संलग्न करना आवश्यक होगा।
2. माइनर कार्प हैचरी एवं कैट फिश हैचरी अधिष्ठापन हेतु आवेदक के पास 1 एकड़ भूमि (भूमि निजी/लीज पर तथा विवाद रहित) की आवश्यकता होगी।
3. पालन मात्स्यिकी हेतु नीजी/लीज (एकरारनामा 11 माह)/वैध पट्टा (सरकारी बंदोबस्त तालाब में) पर तालाब/बायोफ्लॉक टैंक/आर0ए0एस0 इकाई होना आवश्यक है।
4. पालन मात्स्यिकी में एक व्यक्ति/परिवार को अधिकतम 01 एकड़ (02 इकाई) तथा न्यूनतम 0.25 एकड़ जलक्षेत्र की अनुमान्यता होगी।

अनुदान देयः–

योजनान्तर्गत सभी वर्गों के लाभूकों एवं सभी अवयवों के लिए निर्धारित इकाई लागत का 60 प्रतिशत अनुदान देय है। शेष राशि लाभार्थी द्वारा स्वयं अथवा बैंक ऋण से वहन किया जाएगा।

आवेदन की प्रक्रियाः–

योजना हेतु आवेदन fisheries.bihar.gov.in पर ऑनलाईन प्राप्त किये जायेंगे।
आवेदन करने की अंतिम तिथि 30.08.2024 तक।

इस योजना की विस्तृत जानकारी राज्यादेश संख्या– 3520, दिनांक–26.07.2024 से प्राप्त की जा सकती है जो विभागीय वेबसाईट https://state.bihar.gov.in/ahd/CitizenHome.html पर प्रदर्शित है।

(Source: DFARD, Govt. of Bihar)

Available Extension Literature

Bihar Animal Sciences University

- दुधारू पशुओं में थनेला रोग जानकारी एवं बचाव
- पशु टीकाकरण ईलाज से बेहतर
- स्वच्छ दुग्ध उत्पादन
- तालाब में झींगा पालन विधि
- बैक यार्ड मुर्गीपालन हेतु मुफ्त आहार व्यवस्था
- डेयरी फार्मिंग : एक लाभदायक व्यवसाय
- बकरीपालन आय का अच्छा स्रोत
- निरंतर आए के लिए ब्रायलर फार्म का वैज्ञानिक प्रबंधन
- व्यवसायिक सूकर पालन
- कड़कनाथ मुर्गी पालन : आय का अच्छा साधन
- गायों एवं भैंसों के लिए संतुलित आहार
- बकरियों का आहार प्रबंधन
- हरे चारे का संरक्षण और भंडारण
- पशुओं में खनिज लवण का महत्व
- गर्भपात–लक्षण एवं बचाव
- डेग्नाला रोग जानकारी एवं बचाव
- पशुओं में लंगड़ा बुखार
- पी0पी0आर (बकरी प्लेग)
- नवजात बच्छे / बच्छियों की मुख्य बीमारियां व उनकी रोकथाम
- अफ्रीकी सुकर बुखार
- थैलेरियोसिस एक घातक रक्त परजीवी जनित रोग
- पशुओं में ट्रीपेनोसोमियोसिस (सर्रा) रोग लक्षण एवं बचाव
- पशुओं में साधारण रोग एवं प्राथमिक उपचार
- मिल्क फीवर (दुग्ध ज्वर)
- चूजों का वैज्ञानिक पालन–पोषण (मुर्गी पालन का मुख्य आधार)
- घोड़े में होनेवाली प्रमुख बीमारियां
- पशुओं में फेसियोलोसिस रोग एवं इसके रोकथाम
- पशुओं में ब्रूसेलोसिस
- सूकरों की बीमारियों पहचान एवं बचाव
- कृत्रिम गर्भाधान पशुओं में नस्ल सुधार
- मछलियों के रोग रोकथाम व् उपचार
- पशुओं में बाह्य एवं अंत परजीवी से हानि एवं बचाव
- गायों एवं भैसों में गर्मी (म्जतने) के लक्षण एवं कृत्रिम गर्भाधान की समय अवधि
- वर्षीय हरा चारा फसल चक्र
- सूखे चारे की यूरिया उपचार विधि एवं पशुपालन में में महत्व
- मवेशियों में कीटोसिस कारण , निदान और उपचार
- जानवरों में रोगों की रोकथाम के उपाय
- नवजात बछड़े की देखभाल रवं नाभि संक्रमण से बचाव के उपाय
- प्रसवोत्तर गाय की देखभाल एवं प्रबंधन
- पशुओं में विकृमिकारण (Deworming)
- बकरियों में परजीवी रोग
- एजोला–पशुओ के लिए एक वैकल्पिक प्रोटीन स्रोत
- एवियन इन्फ्लुएंजा एवं इसके बचाव
- पशुओं में अफरा रोग–पहचान
- पशुओं में सींग रोधन एवं उसके लाभ
- स्वचछ दूध उत्पादन जरुरतऔर निदान
- खुरपका–मुंहपका रोग एवं नियंत्रण
- गांठदार त्वचा रोग एक उभरता हुआ विषाणु रोग
- पशुधन बीमा योजना पशुपालन में जोखिम प्रबंधन का कारगर उपाय
- दुग्ध उघमिता विकास

(https:basu.org.in/extension-publication)

Role Model Farmers

S.No.	Name of Farmers	Achievements
1	**Sh. Sarvesh Kumar** District: Begusarai (Mob No: 93040-07906)	He is a Ex-Civil Servant turns Progressive Farmer cum Cattle Breeder. Provides consultancy for sexed semen, embryo transfer, value addition of milk products and increase in rural income and prosperity. Advocate of cow-based manures and fertilisers promoting circular rural economy. Founder of Ganga Godham (150+ cows) and Navganga Silage (year-round fodder solution). He promotes organized farmer groups, breed improvement, training & market access. Founder and Chairman of Shamho Cattle Breed Farmers Producer Company Ltd, with a membership of 1,000 farmers. Founder of Brajesh Kumar Foundation, which runs various educational institutes. Ganga Dairy Ltd. Since 1996 having installed capacity of Milk 5+ lakh litres/day. National executive of Ganga Samagrya an organisation working for Ganga and other rivers nationwide
2	**Ms. Khushbu Kumari** Village: Rewtith District: Gopalganj (Mob No: 77590-19999)	Priyamvada Farm with a capacity of producing over one lakh litres of milk annually. The farm is equipped with advance scientific management practices, including imported semen from top TPI bulls listed by the Holstein Association USA. It is the first farm in Bihar to have calves born from the elite bull "Griff" of Worldwide Sire, with five such calves produced. In 2023, the farm successfully implemented an Embryo Transfer Programme in collaboration with Godrej Maximilk, achieving a 60 percent conception rate and producing six genetically superior calves. The farm has also launched the ZIP Service brand for milk and dairy products and is working towards establishing an embryo production ecosystem to serve Eastern and North-Eastern India.
3	**Sh. Yaduvendra Kishore** Village Khutauna Distrct: Madhubani (Mob No: 98017-56146)	After doing PG in Business Entrepreneurship, returned back to Bihar to join his Family business. An agriculture enthusiast working on IFS and Natural Farming wherein, he had integrated different activities ie, Indigenous cows breeding farm (Sahiwal and Tharparkar), primarily focussed on adopting cow centric farming methods vermicomposting, Jeevamrit, Ghanjeevamrit, Amrut Jal and others. Along with this engaged in Fisheries, Makhana, Horticulture, staple crop farming cultivation
4	**Sh. Santosh Kumar** Bir, Block - Dhanarua, Patna (Mob No: 90525-64953)	He is the owner of Anandsagar Natural Dairy Farm Pvt Ltd having a brand name of Deshimoo a dairy based start-up recognised under startup Bihar policy and supported by NABARD. Deshimoo is helping resource poor rural dairy farmers with access to credit and urban markets ensuring reasonable and regular monthly income. Currently Deshimoo working with 30+ farmers and marketing 500+ Ltrs of milk per day to quality conscious Patna based urban households.

S.No.	Name of Farmers	Achievements
5	**Sh. Ram Kumar Baitha** Village: Dheksara Panchayat- Teusa District- Kishanganj (Mob No: 94314-78306)	Mr. Ram Kumar Baitha is a small farmer with a landholding of 0.25 ha, educated up to Class 10, and having 7 years of farming experience. He has shown keen interest in farm intensification and adoption of modern technologies. For the last two years, he has been practicing integrated farming, comprising six crossbred cows, two buffaloes, vegetable cultivation, and the cultivation of chilli and coriander. He has also established a vermi-compost unit, the produce of which is used in his vegetable fields, enhancing soil health and reducing input costs. Through scientific dairy management and integrated farming practices, he earns an annual income of approximately ₹8.0 lakh from dairy farming and ₹9.5 lakh per annum from the overall integrated farming system, reflecting the economic viability of smallholder intensification.
6	**Sh. Santosh Kumar** Address: Vill- Serthuwa, Block- hulashganj, Jehanabad (Mob No: 96613-23490)	He is a progressive livestock farmer and agri-entrepreneur who has successfully integrated scientific dairy farming with crop and vegetable production. He practices calf production through sorted sex semen technology and artificial insemination using superior breeds such as Sahiwal, Gir, Crossbred HF, and improved Murrah buffalo, along with other upgraded buffalo breeds. He also ensures round-the-year availability of quality green fodder by cultivating improved fodder varieties such as Jai (Kent), Berseem (Wardan), and Hybrid Napier. The farm functions as a successful entrepreneurial model, supplying milk from Sahiwal, Gir, Crossbred HF, improved Murrah, and other buffalo breeds, with an approximate annual milk production of 550 quintals. Through adoption of improved technologies and diversification, his net income increased to approximately ₹11.0 lakh. Additionally, his gross income from vegetable farming alone ranges between ₹22–23 lakh annually.
7	**Sh. Dilip Kumar** Village: Jhunathi District: Arwal (Mob No: 72508-53454)	He started his dairy farm with just six high-yielding dairy cows, he began a methodical and scientific approach to building his herd and business. Today, his modernised shed houses 40 high-breed cattle, and he runs a milk collection centre, ensuring direct market access and timely payments. He possesses 4 acres dedicated to hybrid Napier grass, grown using advanced techniques. He now sells fodder to farmers across districts. Homemade balanced feed rations using fenugreek, turmeric, minerals, soya husk, and oilcake, customised per lactation cycle. A biogas plant fuelled by cattle waste, used for cooking and lighting, cuts fuel costs while improving sustainability.

S.No.	Name of Farmers	Achievements
8	**Ms. Supriya** Village- Chintamani Chak. Mokama (Mob No: 97251-10079)	TDM Dairy Farm, owned by Ms. Supriya, is located at Chintamani Chak, Mokama. The farm maintains a total herd strength of 101 Holstein Friesian (HF) and Jersey. With efficient management practices and scientific feeding, the farm achieves an average daily milk production of approximately 680 litres. The milk is sold at a rate of ₹ 50 per litre. Farmers from multiple states including Bihar, Jharkhand, Uttar Pradesh, West Bengal, Odisha, Chhattisgarh, Madhya Pradesh, and Assam visited and attended the training programs at TDM dairy farm regularly. Her HF cattle won the first prize in Dairy and Cattle Expo (2023 and 2026).
9	**Sh. Sahanwaj Anjum** Sakri, Kurhani, Muzaffarpur (Mob No: 98529-90008)	He is a progressive goat farmer and rural entrepreneur who has established "Unnat Goat Farm" as a model unit of scientific goat production in Bihar. His primary farm activity involves rearing pure breeds of goats such as Barbari (250), Boyer (50), Jamunapari (20) & Sirohi (15) breeds. He has fetched premium prices upto ₹75,000 to ₹85,000 per animal for Jamunapari males. His net income from goat farming is estimated to be around ₹15–20 lakh per year. He also ensures year-round nutritional security by cultivating green fodder crops such as Hybrid Napier and Guinea grass for goat feeding.
10	**Sh. Chandra Bhanu Kumar** Village- Kalaunda, Block- Akbarpur, District- Nawada (Mob No: 9955504230)	He is a progressive farmer who diversified into commercial layer poultry farming, which has become a major component of his success. He manages a BV-300 layer unit with a capacity of 11,500 birds housed in a well-structured shed measuring 235 × 40 feet. His farm achieves an average production of approximately 10,400 eggs per day. As an agri-entrepreneur, the sale of cereals, pulses, vegetables, and fruits generates an annual income of ₹40–45 lakh. Additionally, layer farming contributes another ₹30–35 lakh per annum through egg sales.
11	**Sh. Saurabh Kumar** Village: Jhandapur, Block: Bihpur, Bhagalpur (Mob: 88735-79657)	He is young agri-entrepreneur engaged in integrated aquaculture, nursery management, and allied enterprises. He has adopted advanced fish seed production techniques, ensuring the systematic production of high-quality fish seed and table fish. He has developed specialized nursery raising techniques, particularly for forest plants and fruit crops. In addition to aquaculture and nursery enterprises, he also produces A2 milk and rears ducklings as part of his diversified farming system. He earns a total gross income of approximately ₹1.21 crore per annum.

WAY FORWARD

- Establishment of Technology Business Incubator (TBI) Centre at BASU-Patna
- Entrepreneurship Development Program (EDP) in Dairy Food Processing (Min. of Industry Govt. of Bihar)
- Empowering of Livestock based SHG Groups under JEEVIKA (Processing and Value Addition)
- Skill Development Centre at BASU-Patna under Bihar Skill Development Mission
- Awareness creation on important Indigenous milch breeds of cattle and buffalo to be promoted in the state
- Application of ARTs (Assisted Reproductive Techniques)–OPU, IVF, ETT, Multiple Ovulation and Embryo Transfer (MOET) and Promotion of Sexed-sorted Semen
- Conservation of forage resources through silage production to mitigate calamities and ease of transport
- Formation of Breeder Societies of dairy animals
- Regular capacity building/awareness programs for the livestock owners of flood/draught and fire prone areas.
- Periodic livestock championship/competition to be organized at State Level and their performance recording
- Development of handy literature material for the farmers.
- Regular Technological Backstopping of BASU to the KVKs, DFARD and other line departments personnel
- Promotion of scientific and climate-resilient aquaculture practices, integrated fish farming, and expanding capacity building through structured training and digital extension services.

Expected Outcomes

- Improved livestock productivity and farm profitability
- Enhanced income and livelihood security of smallholders
- Conservation and sustainable use of indigenous breeds
- Improved animal health and reproductive efficiency
- Strengthened resilience of livestock systems to climate variability
- Increase fish production and productivity

Notes

बिहार पशु विज्ञान विश्वविद्यालय
पटना–800014, बिहार

नामांकन नोटिस

बिहार पशु विज्ञान विश्वविद्यालय, पटना के अधीन बिहार पशु चिकित्सा महाविद्यालय,पटना एवं संजय गाँधी गव्य प्रौद्योगिकी संस्थान, पटना में शैक्षणिक सत्र 2025–2026 में नये पाठ्यक्रम शुरू किए जा रहा है, नामांकन हेतु विवरणी निम्नवत् है:–

बिहार पशु चिकित्सा महाविद्यालय, पटना

कोर्स का नाम	अवधि
बी.एस.सी. (पोल्ट्री प्रोडक्शन)	3 वर्ष (6 सेमेस्टर)

पैरा वेटरनरी साइंसेज

कोर्स का नाम	अवधि
डिप्लोमा इन वेटरनरी एंड लाइवस्टॉक डेवलपमेंट (डी.वी.एल.डी.)	2 वर्ष (4 सेमेस्टर)
डिप्लोमा इन वेटरनरी लेबोरेटरी टेक्नोलॉजी (डी. वी. एल. टी.)	2 वर्ष (4 सेमेस्टर)
सर्टिफिकेट कोर्स इन आर्टिफिशियल इन्सेमिनेशन	3 माह

पोस्ट ग्रेजुएट डिप्लोमा

ऑनलाईन – वेटरनरी होम्योपैथी, एथ्नोवेटरनरी मेडिसिन, वन हेल्थ,
ऑफलाईन – बोवाइन क्लिनिकल प्रैक्टिस, कैनाइन एंड फेलाइन क्लिनिकल प्रैक्टिस ।

एडवांस ट्रेनिंग कोर्स ऑन इम्पोर्टेंट वेटरनरी क्लिनिकल प्रोसीजर
अवधि: 3 सप्ताह, प्रवेश क्षमता: 6

सर्टिफिकेट कोर्स

वेटरनरी फॉरेंसिक साइंस, सीमन हैंडलिंग एवं आर्टिफिशियल इन्सेमिनेशन, मॉलिक्यूलर डायग्नोसिस ऑफ इन्फेक्शस डिजीजेस, वेटरनरी डायग्नॉस्टिक इमेजिंग, एम्ब्रायो ट्रांसफर टेक्नोलॉजी (आईवीएफ) इन बोवाइन।

ऑनलाइन पाठ्यक्रम

फीड एवं फॉडर टेक्नोलॉजी पर ऑनलाइन शार्ट कोर्स
प्रसार एवं उद्यमिता विकास पर ऑनलाइन शार्ट कोर्स

संजय गाँधी गव्य प्रौद्योगिकी संस्थान, पटना

कोर्स का नाम	अवधि
बी.टेक. (एफ.टी.)	4 वर्ष (8 सेमेस्टर)

प्रवेश क्षमता, अवधि एवं सभी कोर्स की विस्तृत जानकारी हेतु विश्वविद्यालय की वेबसाइट **www. basu.org.in** पर अपलोड किए गए विवरण पुस्तिका को देखें।

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