LIVESTOCK TECHNOLOGY

LT

Pulse of Livestock Industry

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From the Editor's Desk

The recent gas crisis affects the Indian Dairy Sector

One of the most critical short-term challenges is the energy (gas/LPG) shortage, which is directly affecting dairy processing. Milk pouch production has slowed due to gas shortages and packaging disruptions. Some dairies report only ~10 days of packaging stock, threatening supply continuity. In Rajasthan, 20% reduction in natural gas supply is impacting milk processing and public supply systems. Dairy is an energy-intensive sector (pasteurisation, chilling, drying). These disruptions highlight the dependence on fossil fuels and the need for energy diversification (biogas, solar, and electric boilers). Large players like Amul and Mother Dairy remain resilient due to backward integration and energy alternatives.

A major structural concern has emerged due to ultra-low pricing on quick-commerce platforms. Milk reportedly sold at ₹1/litre (promotional pricing) triggered complaints to regulators. Cooperative unions warn of farmer income erosion, destabilisation of traditional supply chains and a threat to rural livelihoods. This reflects a larger shift - entry of venture-funded digital platforms, potential "winner-takes-all" pricing strategies and pressure on cooperative models.

The Food Safety and Standards Authority of India (FSSAI) has mandated registration for all independent milk vendors and producers. It is a move towards formalisation and traceability. It will help to improve food safety standards. But it will create a potential compliance burden on small farmers/vendors in the short term. This aligns with India's long-term push toward organised dairy markets and export competitiveness.

The National Bank for Agriculture and Rural Development has highlighted the crucial role of India's dairy industry in protecting rural livelihoods, describing it as a "safety net for farmers" during periods of crop failure or income instability. The dairy sector provides regular cash flow to farmers, unlike seasonal crop income, helping households maintain financial stability and meet daily expenses. The sector is dominated by small and marginal farmers, many of whom own only a few cattle but depend on milk sales for steady earnings. Strengthening dairy value chains, improving credit access and expanding infrastructure such as chilling, processing and market linkages will be critical for sustaining farmer incomes and boosting rural economic growth.

Milk production in Uttarakhand has increased by 3.1%, reaching 1,957.2 thousand tonnes in FY 2025-26, up from 1,897.8 thousand tonnes in FY 2024-25. The state's per capita daily milk availability stands at 456 grams, close to the national average of 485 grams. Uttarakhand's dairy sector has shown steady growth over the past decade, with production rising from 1,656 thousand tonnes in 2015-16 to the present level. The state government has allocated ₹93 crore for dairy development in the current fiscal, with a proposed increase to ₹140 crore in the next financial year to further strengthen the sector.

Punjab Animal Husbandry, Dairy Development and Fisheries Ministry had invited global investors to explore opportunities in the state's dairy and animal nutrition sectors at the Progressive Punjab Investors Summit 2026, highlighting the government's vision to position Punjab as a global hub for cattle feed, animal nutrition and dairy processing. Punjab currently records per capita milk availability of about 1,318 grams per day—nearly three times the national average—while annual milk production exceeds 14.5 million tonnes, reflecting strong dairy fundamentals supported by progressive farmers, modern infrastructure and policy support. Global companies such as Cargill and De Heus have established modern feed plants. To further boost productivity, the state is promoting commercial silage production with subsidies and encouraging hydroponic fodder systems. Guru Angad Dev Veterinary and Animal Sciences University is providing scientific expertise and area-specific mineral mixtures to improve animal health and milk yield. A large share of milk in the state is still consumed without processing, creating significant opportunities for investments in value-added products such as paneer, ghee, ice cream and flavoured milk. Punjab's veterinary infrastructure includes 1,367 veterinary hospitals, 1,489 dispensaries and 22 district-level polyclinics, while advanced reproductive technologies such as IVF and sex-sorted semen are being adopted to increase the population of elite female dairy animals and further enhance productivity.

Editor

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ਸੂਰਾਂ ਵਿੱਚ ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ ਦੀ ਬਿਮਾਰੀ

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ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਫੀਵਰ (CSF), ਜਿਸਨੂੰ ਹੌਗ ਹੈਜ਼ਾ ਵੀ ਕਿਹਾ ਜਾਂਦਾ ਹੈ, ਇੱਕ ਬਹੁਤ ਹੀ ਛੂਤ ਵਾਲੀ ਵਾਇਰਲ ਬਿਮਾਰੀ ਹੈ ਜੋ ਸੂਰਾਂ ਅਤੇ ਜੰਗਲੀ ਸੂਰਾਂ ਨੂੰ ਪ੍ਰਭਾਵਿਤ ਕਰਦੀ ਹੈ। ਇਹ ਬਿਮਾਰੀ ਪੈਸਟੀਵਾਇਰਸ ਕਾਰਨ ਹੁੰਦੀ ਹੈ। ਪ੍ਰਭਾਵਿਤ ਸੂਰਾਂ ਵਿੱਚ ਬੁਖਾਰ, ਕਮਜ਼ੋਰੀ, ਖੂਨ ਵਗਣਾ ਅਤੇ ਦਸਤ ਵਰਗੇ ਲੱਛਣ ਦਿਖਾਈ ਦਿੰਦੇ ਹਨ। ਬਿਮਾਰੀ ਸੰਕਰਮਿਤ ਜਾਨਵਰਾਂ ਦੇ ਸਿੱਧੇ ਸੰਪਰਕ ਰਾਹੀਂ ਜਾਂ ਦੂਸ਼ਿਤ ਫੀਡ ਅਤੇ ਉਤਪਾਦਾਂ ਰਾਹੀਂ ਫੈਲਦੀ ਹੈ, ਅਤੇ ਇਸ ਨਾਲ ਸੂਰ ਪਾਲਕਾਂ ਨੂੰ ਕਾਫ਼ੀ ਆਰਥਿਕ ਨੁਕਸਾਨ ਹੋ ਸਕਦਾ ਹੈ। CSF ਲਈ ਕੋਈ ਖਾਸ ਇਲਾਜ ਨਹੀਂ ਹੈ, ਇਸ ਲਈ ਨਿਯੰਤਰਣ ਉਪਾਅ ਆਮ ਤੌਰ 'ਤੇ ਟੀਕਾਕਰਨ, ਸਖ਼ਤ ਜੈਵਿਕ ਸੁਰੱਖਿਆ ਅਭਿਆਸਾਂ, ਅਤੇ, ਕੁਝ ਮਾਮਲਿਆਂ ਵਿੱਚ, ਪ੍ਰਭਾਵਿਤ ਜਾਨਵਰਾਂ ਨੂੰ ਮਾਰਨ 'ਤੇ ਨਿਰਭਰ ਕਰਦੇ ਹਨ।

ਬਿਮਾਰੀ ਦਾ ਕਾਰਨ: ਇਹ ਬਿਮਾਰੀ ਫਲੇਵੀਵਿਰੀਡੇ ਪਰਿਵਾਰ ਦੇ ਪੇਸਟੀਵਾਇਰਸ ਜੀਨਸ ਨਾਲ ਸਬੰਧਤ ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਫੀਵਰ ਵਾਇਰਸ (CSFV) ਕਾਰਨ ਹੁੰਦੀ ਹੈ।

ਪ੍ਰਭਾਵਿਤ ਪਸ਼ੂ: ਬਿਮਾਰੀ ਸਿਰਫ਼ ਸੂਰਾਂ ਅਤੇ ਜੰਗਲੀ ਸੂਰਾਂ ਨੂੰ ਪ੍ਰਭਾਵਿਤ ਕਰਦੀ ਹੈ।

ਫੈਲਾਅ: ਫੈਲਾਅ ਦਾ ਸਭ ਤੋਂ ਆਮ ਤਰੀਕਾ ਸਿਹਤਮੰਦ ਸੂਰਾਂ ਅਤੇ ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ ਵਾਇਰਸ ਨਾਲ ਸੰਕਰਮਿਤ ਸੂਰਾਂ ਵਿਚਕਾਰ ਸਿੱਧਾ ਸੰਪਰਕ ਹੈ। ਵਾਇਰਸ ਲਾਰ, ਪਿਸ਼ਾਬ ਅਤੇ ਮਲ ਵਿੱਚ ਮੌਜੂਦ ਹੁੰਦਾ ਹੈ ਅਤੇ ਸੰਕਰਮਿਤ ਸੂਰਾਂ ਜਾਂ ਦੂਸ਼ਿਤ ਸਮੱਗਰੀ ਨਾਲ ਸਿੱਧੇ ਸੰਪਰਕ ਰਾਹੀਂ ਫੈਲ ਸਕਦਾ ਹੈ। ਜਦੋਂ ਮਾਸ ਨੂੰ ਫਰਿੱਜ ਵਿੱਚ ਰੱਖਿਆ ਜਾਂਦਾ ਹੈ, ਤਾਂ CSF ਵਾਇਰਸ ਸੂਰਾਂ ਅਤੇ ਪ੍ਰੋਸੈਸ ਕੀਤੇ ਸੂਰਾਂ ਦੇ ਉਤਪਾਦਾਂ ਵਿੱਚ ਮਹੀਨਿਆਂ ਤੱਕ ਅਤੇ ਜੰਮੇ ਹੋਏ ਮਾਸ ਵਿੱਚ ਸਾਲਾਂ ਤੱਕ ਜਿਉਂਦਾ ਰਹਿ ਸਕਦਾ ਹੈ। ਸਿਹਤਮੰਦ ਸੂਰ CSF-ਸੰਕਰਮਿਤ ਸੂਰ ਦੇ ਮਾਸ ਜਾਂ ਉਤਪਾਦਾਂ ਨੂੰ ਖਾਣ ਨਾਲ ਸੰਕਰਮਿਤ ਹੋ ਸਕਦੇ ਹਨ। ਇਹ ਵਾਇਰਸ ਸੂਰ ਦੇ ਉਤਪਾਦਾਂ, ਖਾਦ, ਉਪਕਰਣਾਂ, ਕੱਪੜਿਆਂ, ਵਾਹਨਾਂ ਅਤੇ ਵਾਤਾਵਰਣ ਵਿੱਚ ਲੰਬੇ ਸਮੇਂ ਤੱਕ ਜਿਉਂਦਾ ਰਹਿੰਦਾ ਹੈ ਜਿਸ ਕਰਕੇ ਦੂਸ਼ਿਤ ਉਪਕਰਣਾਂ, ਫੀਡ, ਵਾਹਨਾਂ ਅਤੇ ਆਵਾਜਾਈ ਪ੍ਰਣਾਲੀਆਂ ਅਤੇ ਲੋਕਾਂ ਰਾਹੀਂ ਅਸਿੱਧੇ ਸੰਪਰਕ ਰਾਹੀਂ ਸੰਚਾਰਿਤ ਹੋ ਸਕਦਾ ਹੈ।

ਲੱਛਣ: ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਫੀਵਰ ਵਾਇਰਸ ਨਾਲ ਸੰਕਰਮਿਤ ਸੂਰਾਂ ਵਿੱਚ ਲੱਛਣ ਜਿਵੇਂ ਤੇਜ਼ ਬੁਖਾਰ, ਸੁਸਤੀ, ਭੁੱਖ ਨਾ ਲੱਗਣਾ, ਉਲਟੀਆਂ, ਦਸਤ ਜਾਂ ਕਬਜ਼, ਕੰਨਾਂ ਅਤੇ ਪੇਟ ਦੇ ਹੇਠਲੇ ਹਿੱਸੇ ਅਤੇ ਲੱਤਾਂ ਤੇ ਜਾਮਨੀ ਧੱਬੇ ਦੇਖੇ ਜਾ ਸਕਦੇ ਹਨ। ਗਰਭਪਾਤ ਅਤੇ ਮਰੇ ਹੋਏ ਬੱਚੇ ਦੇ ਜਨਮ ਵਰਗੀਆਂ ਪ੍ਰਜਨਨ ਸਮੱਸਿਆਵਾਂ ਵੀ ਹੋ ਸਕਦੀਆਂ ਹਨ। ਇਹ ਬਿਮਾਰੀ ਵੱਖ-ਵੱਖ ਰੂਪਾਂ ਵਿੱਚ ਹੁੰਦੀ ਹੈ, ਜਿਸ ਵਿੱਚ ਤੀਬਰ, ਕ੍ਰੋਨਿਕ ਅਤੇ ਸਬਕਲੀਨਿਕਲ ਰੂਪ ਸ਼ਾਮਲ ਹਨ। ਗੰਭੀਰ ਮਾਮਲੇ ਅਕਸਰ ਘਾਤਕ ਹੁੰਦੇ ਹਨ। ਤੀਬਰ ਰੂਪ ਵਿੱਚ ਲੱਛਣ ਜਿਵੇਂ ਕਿ ਅਚਾਨਕ ਤੇਜ਼ ਬੁਖਾਰ 41°C (105.8°F) ਤੋਂ ਵੱਧ ਦੀ ਸ਼ੁਰੂਆਤ, ਕੰਨਾਂ, ਪੇਟ ਅਤੇ ਲੱਤਾਂ ਦਾ ਜਾਮਨੀ/ਨੀਲਾ ਰੰਗ, ਭੁੱਖ ਨਾ ਲੱਗਣਾ,ਦਸਤ ਅਤੇ ਉਲਟੀਆਂ (ਕਈ ਵਾਰ ਖੂਨ ਦੇ ਨਾਲ), ਤੰਤੂ ਵਿਗਿਆਨਕ ਚਿੰਨ੍ਹ (ਕੰਪਨ, ਅਸੰਗਤਤਾ) ਦੇਖੇ ਜਾ ਸਕਦੇ ਹਨ। ਬਿਮਾਰੀ ਦੇ ਇਸ ਰੂਪ ਵਿੱਚ ਮੌਤ ਲਾਗ ਤੋਂ ਬਾਅਦ 10 ਦਿਨਾਂ ਦੇ ਅੰਦਰ ਹੁੰਦੀ ਹੈ। ਕ੍ਰੋਨਿਕ ਬਿਮਾਰੀ ਵਿੱਚ ਹਲਕਾ ਜਾਂ ਰੁਕ-ਰੁਕ ਕੇ ਬੁਖਾਰ ਆਉਂਦਾ ਹੈ। ਮਾੜਾ ਵਾਧਾ ਅਤੇ ਭਾਰ ਘਟਣਾ, ਚਮੜੀ ਦੇ ਜਖਮ ਅਤੇ ਪੁਰਾਣੇ ਅਲਸਰ, ਰੁਕ-ਰੁਕ ਕੇ ਦਸਤ, ਕਮਜ਼ੋਰੀ ਅਤੇ ਸੁਸਤੀ ਦੇਖੀ ਜਾ ਸਕਦੀ ਹੈ। ਮੌਤ ਦਰ ਘੱਟ ਹੁੰਦੀ ਹੈ, ਪਰ ਸੂਰ ਲੰਬੇ ਸਮੇਂ ਦੇ ਵਾਹਕ ਬਣ ਸਕਦੇ ਹਨ। ਸਬਕਲੀਨਿਕਲ ਰੂਪ ਵਿੱਚ, ਜਾਨਵਰ ਆਮ ਤੌਰ 'ਤੇ ਬਿਮਾਰੀ ਦੇ ਕੋਈ ਸਪੱਸ਼ਟ ਕਲੀਨਿਕਲ ਸੰਕੇਤ ਨਹੀਂ ਦਿਖਾਉਂਦੇ, ਜਿਸ ਨਾਲ ਪਤਾ ਲਗਾਉਣਾ ਮੁਸ਼ਕਲ ਹੋ ਜਾਂਦਾ ਹੈ। ਪ੍ਰਭਾਵਿਤ ਸੂਰਾਂ ਵਿੱਚ ਘੱਟ ਵਿਕਾਸ ਅਤੇ ਥੋੜ੍ਹਾ ਜਿਹਾ ਭਾਰ ਘਟ ਸਕਦਾ ਹੈ। ਹਲਕੇ, ਗੈਰ-ਵਿਸ਼ੇਸ਼ ਸੰਕੇਤ ਜਿਵੇਂ ਕਿ ਅਸਥਾਈ ਬੁਖਾਰ ਜਾਂ ਨਰਮ ਮਲ ਹੋ ਸਕਦਾ ਹੈ। ਪ੍ਰਜਨਨ ਸੂਰਾਂ ਵਿੱਚ, ਸੂਖਮ ਪ੍ਰਜਨਨ ਸਮੱਸਿਆਵਾਂ ਦਿਖਾਈ ਦੇ ਸਕਦੀਆਂ ਹਨ, ਅਤੇ ਜਮਾਂਦਰੂ ਤੌਰ 'ਤੇ ਸੰਕਰਮਿਤ ਬੱਚੇ ਸੂਰਾਂ ਵਿੱਚ ਕਮਜ਼ੋਰੀ ਅਤੇ ਕਮਜ਼ੋਰ ਪ੍ਰਤੀਰੋਧਕ ਸ਼ਕਤੀ ਦਿਖਾਈ ਦੇ ਸਕਦੀ ਹੈ। ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਫੀਵਰ (CSF) ਜ਼ੂਨੋਟਿਕ ਬਿਮਾਰੀ ਨਹੀਂ ਹੈ, ਭਾਵ ਇਹ ਮਨੁੱਖਾਂ ਨੂੰ ਪ੍ਰਭਾਵਿਤ ਨਹੀਂ ਕਰਦੀ।

ਬਿਮਾਰੀ ਦੀ ਪਛਾਣ: ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ (CSF) ਦਾ ਨਿਦਾਨ ਕਲੀਨਿਕਲ ਜਾਂਚ, ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਵਿੱਚ ਟੈਸਟਾਂ ਅਤੇ ਮਹਾਂਮਾਰੀ ਸੰਬੰਧੀ ਜਾਣਕਾਰੀ ਦੇ ਸੁਮੇਲ 'ਤੇ ਨਿਰਭਰ ਕਰਦਾ ਹੈ। ਕਿਉਂਕਿ ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ ਦੀ ਬਿਮਾਰੀ ਦੇ ਲੱਛਣ ਸੂਰਾਂ ਦੀਆਂ ਹੋਰ ਬਿਮਾਰੀਆਂ ਨਾਲ ਮਿਲਦੇ-ਜੁਲਦੇ ਹੋ ਸਕਦੇ ਹਨ, ਇਸ ਲਈ ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਦੀ ਪੁਸ਼ਟੀ ਜ਼ਰੂਰੀ ਹੈ। ਬਿਮਾਰੀ ਦੀ ਨਿਸ਼ਚਿਤ ਪੁਸ਼ਟੀ ਅਤੇ CSF ਵਾਇਰਸ ਦੀ ਪਛਾਣ ਆਮ ਤੌਰ 'ਤੇ ਖੂਨ, ਟਿਸ਼ੂਆਂ ਦੇ ਨਮੂਨਿਆਂ, ਜਾਂ ਰਿਸਾਅ ਵਿੱਚ ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਵਿੱਚ ਟੈਸਟਾਂ ਦੁਆਰਾ ਜਿਵੇਂ ਆਰਟੀ-ਪੀਸੀਆਰ, ਵਾਇਰਸ ਆਈਸੋਲੇਸ਼ਨ ਜਾਂ ਇਮਯੂਨੋਫਲੋਰੇਸੈਂਸ ਤਕਨੀਕਾਂ ਰਾਹੀਂ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ। ਸਕ੍ਰੀਨਿੰਗ ਅਤੇ ਨਿਗਰਾਨੀ ਲਈ ਵਾਇਰਲ ਐਂਟੀਜੇਨ ਜਾਂ ਐਂਟੀਬਾਡੀਜ਼ ਦਾ ਪਤਾ ELISA ਦੁਆਰਾ ਲਗਾਇਆ ਜਾ ਸਕਦਾ ਹੈ।

ਰੋਕਥਾਮ ਅਤੇ ਨਿਯੰਤਰਣ: ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ (CSF) ਦੀ ਰੋਕਥਾਮ ਅਤੇ ਨਿਯੰਤਰਣ ਸਖ਼ਤ ਜੈਵਿਕ ਸੁਰੱਖਿਆ 'ਤੇ ਨਿਰਭਰ ਕਰਦਾ ਹੈ, ਜਿਸ ਵਿੱਚ ਸੂਰਾਂ ਦੀ ਗਤੀ ਨੂੰ ਕੰਟਰੋਲ ਕਰਨਾ, ਫਾਰਮ ਦੀ ਸਫਾਈ ਬਣਾਈ ਰੱਖਣਾ, ਅਤੇ ਸੰਭਾਵੀ ਤੌਰ 'ਤੇ ਸੰਕਰਮਿਤ ਸੂਰਾਂ ਜਾਂ ਜੰਗਲੀ ਸੂਰਾਂ ਨਾਲ ਸੰਪਰਕ ਨੂੰ ਰੋਕਣਾ ਸ਼ਾਮਲ ਹੈ।

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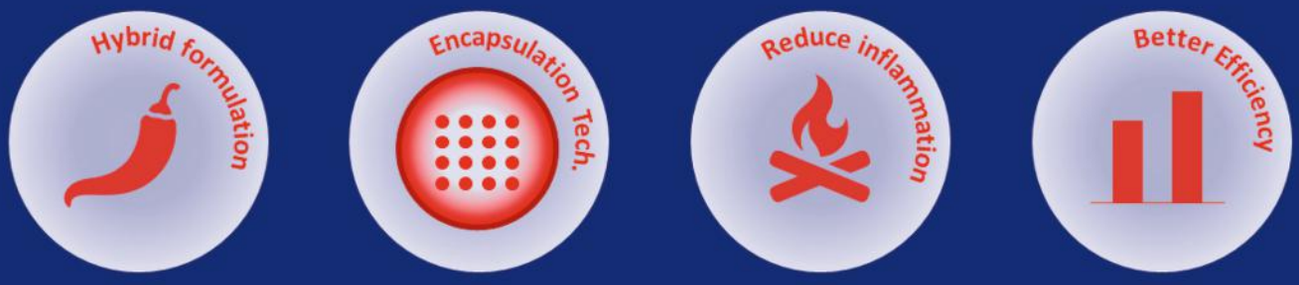

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ਇਸ ਬਿਮਾਰੀ ਨੂੰ ਸਖ਼ਤ ਸਫਾਈ ਅਤੇ ਜੈਵਿਕ ਸੁਰੱਖਿਆ ਉਪਾਵਾਂ ਨੂੰ ਅਪਣਾ ਕੇ ਸਭ ਤੋਂ ਵਧੀਆ ਢੰਗ ਨਾਲ ਰੋਕਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਇਹ ਯਕੀਨੀ ਬਣਾਉਣਾ ਚਾਹੀਦਾ ਹੈ ਕਿ ਘਰੇਲੂ ਸੂਰ ਜੰਗਲੀ ਸੂਰਾਂ ਦੇ ਸੰਪਰਕ ਵਿੱਚ ਨਾ ਆਉਣ। ਬਿਮਾਰੀ ਦੇ ਫੈਲਣ ਦੀ ਸਥਿਤੀ ਵਿੱਚ, ਪ੍ਰਭਾਵਿਤ ਫਾਰਮਾਂ 'ਤੇ ਸੰਕਰਮਿਤ ਅਤੇ ਸੰਪਰਕ ਵਿੱਚ ਆਏ ਸਾਰੇ ਸੂਰਾਂ ਨੂੰ ਆਮ ਤੌਰ 'ਤੇ ਮਾਰ ਦਿੱਤਾ ਜਾਂਦਾ ਹੈ, ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ ਸਰੀਰ, ਬਿਸਤਰੇ ਅਤੇ ਹੋਰ ਸਮੱਗਰੀ ਨੂੰ ਸੁਰੱਖਿਅਤ ਢੰਗ ਨਾਲ ਨਿਪਟਾਇਆ ਜਾਂਦਾ ਹੈ। ਪ੍ਰਭਾਵਿਤ ਫਾਰਮਾਂ ਦੇ ਨੇੜੇ ਦੇ ਖੇਤਰਾਂ ਦੀ ਨਿਗਰਾਨੀ ਕੀਤੀ ਜਾਂਦੀ ਹੈ। ਪੂਰੀ ਤਰ੍ਹਾਂ ਕੀਟਾਣੂ-ਰਹਿਤ ਕਰਨਾ, ਅਤੇ ਕੁਆਰੰਟੀਨ ਜ਼ੋਨ ਸਥਾਪਤ ਕਰਨਾ ਫੈਲਣ ਨੂੰ ਰੋਕਣ ਵਿੱਚ ਸਹਾਇਤਾ ਕਰਦਾ ਹੈ। ਉਨ੍ਹਾਂ ਥਾਵਾਂ 'ਤੇ ਜਿੱਥੇ ਇਹ ਬਿਮਾਰੀ ਆਮ ਹੈ, ਟੀਕਾਕਰਨ ਇਸਨੂੰ ਫੈਲਣ ਤੋਂ ਰੋਕਣ ਵਿੱਚ ਮਦਦ ਕਰ ਸਕਦਾ ਹੈ। ਝੁੰਡ ਪ੍ਰਤੀਰੋਧਕ ਸ਼ਕਤੀ ਬਣਾਉਣ ਲਈ ਸਥਾਨਕ ਖੇਤਰਾਂ ਵਿੱਚ ਪ੍ਰਵਾਨਿਤ ਟੀਕਿਆਂ ਨਾਲ ਟੀਕਾਕਰਨ ਇੱਕ ਮੁੱਖ ਉਪਾਅ ਹੈ। ਬਿਮਾਰੀ ਤੋਂ ਬਿਨਾਂ ਖੇਤਰਾਂ ਵਿੱਚ, "ਸਟੈਂਪਿੰਗ ਆਊਟ" ਪਹੁੰਚ ਵਰਤੀ ਜਾਂਦੀ ਹੈ, ਜਿਸ ਵਿੱਚ ਜਲਦੀ ਪਤਾ ਲਗਾਉਣਾ, ਸੂਰਾਂ ਦੀਆਂ ਹਰਕਤਾਂ ਨੂੰ ਕੰਟਰੋਲ ਕਰਨਾ, ਲਾਸ਼ਾਂ ਦਾ ਸਹੀ ਢੰਗ ਨਾਲ ਨਿਪਟਾਰਾ ਕਰਨਾ, ਅਤੇ ਪੂਰੀ ਤਰ੍ਹਾਂ ਸਫਾਈ ਅਤੇ ਕੀਟਾਣੂ-ਰਹਿਤ ਕਰਨਾ ਸ਼ਾਮਲ ਹੈ। ਨਿਗਰਾਨੀ, ਨਿਯਮਤ ਨਿਗਰਾਨੀ ਅਤੇ ਸ਼ੱਕੀ ਮਾਮਲਿਆਂ ਦੀ ਤੁਰੰਤ ਰਿਪੋਰਟਿੰਗ ਰਾਹੀਂ ਬਿਮਾਰੀ ਦਾ ਜਲਦੀ ਪਤਾ ਲਗਾਉਣਾ ਬਹੁਤ ਜ਼ਰੂਰੀ ਹੈ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਆਵਾਜਾਈ ਪਾਬੰਦੀਆਂ ਲਾਗੂ ਕਰਨਾ ਅਤੇ ਕਿਸਾਨਾਂ ਨੂੰ ਲੱਛਣਾਂ ਦੀ ਪਛਾਣ ਕਰਨ ਬਾਰੇ ਸਿੱਖਿਅਤ ਕਰਨਾ ਨਿਯੰਤਰਣ ਯਤਨਾਂ ਨੂੰ ਹੋਰ ਮਜ਼ਬੂਤੀ ਦਿੰਦਾ ਹੈ।

ਕਲਾਸੀਕਲ ਸਵਾਈਨ ਬੁਖਾਰ ਇੱਕ ਗੰਭੀਰ ਸੂਰ ਰੋਗ ਹੈ, ਪਰ ਇਸਨੂੰ ਸਖ਼ਤ ਸਫਾਈ ਅਤੇ ਸਮੇਂ ਸਿਰ ਟੀਕਾਕਰਨ ਨਾਲ ਰੋਕਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਬਿਮਾਰ ਜਾਨਵਰਾਂ ਦਾ ਜਲਦੀ ਪਤਾ ਲਗਾਉਣਾ ਅਤੇ ਰਿਪੋਰਟ ਕਰਨਾ ਫੈਲਣ ਨੂੰ ਰੋਕਣ ਅਤੇ ਪੂਰੇ ਫਾਰਮ ਦੀ ਰੱਖਿਆ ਕਰਨ ਵਿੱਚ ਮਦਦ ਕਰਦਾ ਹੈ। ਚੰਗੀ ਜੈਵਿਕ ਸੁਰੱਖਿਆ - ਜਿਵੇਂ ਕਿ ਫਾਰਮ 'ਤੇ ਲੋਕਾਂ ਦੇ ਆਉਣ-ਜਾਣ ਨੂੰ ਕੰਟਰੋਲ ਕਰਨਾ, ਨਵੇਂ ਸੂਰਾਂ ਨੂੰ ਕੁਆਰੰਟੀਨ ਕਰਨਾ, ਅਤੇ ਰਹਿੰਦ-ਖੂੰਹਦ ਦਾ ਸਹੀ ਨਿਪਟਾਰਾ ਕਰਨਾ - ਸਭ ਤੋਂ ਵਧੀਆ ਬਚਾਅ ਹੈ। ਕਿਸਾਨਾਂ ਨੂੰ ਪਸ਼ੂਆਂ ਦੇ ਡਾਕਟਰੀ ਮਾਰਗਦਰਸ਼ਨ ਦੀ ਪਾਲਣਾ ਕਰਨੀ ਚਾਹੀਦੀ ਹੈ ਅਤੇ ਨਿਯਮਤ ਸਿਹਤ ਜਾਂਚਾਂ ਨੂੰ ਬਣਾਈ ਰੱਖਣਾ ਚਾਹੀਦਾ ਹੈ। ਸਹੀ ਦੇਖਭਾਲ ਅਤੇ ਰੋਕਥਾਮ ਨਾਲ, CSF ਤੋਂ ਹੋਣ ਵਾਲੇ ਨੁਕਸਾਨ ਨੂੰ ਬਹੁਤ ਘੱਟ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ ਅਤੇ ਝੁੰਡ ਦੀ ਉਤਪਾਦਕਤਾ ਨੂੰ ਸੁਰੱਖਿਅਤ ਰੱਖਿਆ ਜਾ ਸਕਦਾ ਹੈ।

ਪਵਿਤਰ ਕੌਰ[1], ਮੋਨੂੰ ਕਾਰਕੀ[1], ਸਸਮਿਤਾ ਬਾਰਿਕ[2] ਅਤੇ ਮਨਜਿੰਦਰ ਸ਼ਰਮਾ[2]

[1]ਵੈਟਰਨਰੀ ਮਾਈਕ੍ਰੋਬਾਇਓਲੋਜੀ ਵਿਭਾਗ
[2]ਵੈਟਰਨਰੀ ਫਿਜ਼ੀਓਲੋਜੀ ਅਤੇ ਬਾਇਓਕੈਮਿਸਟਰੀ ਵਿਭਾਗ
ਗੁਰੂ ਅੰਗਦ ਦੇਵ ਵੈਟਰਨਰੀ ਅਤੇ ਐਨੀਮਲ ਸਾਇੰਸਜ਼ ਯੂਨੀਵਰਸਿਟੀ, ਲੁਧਿਆਣਾ।

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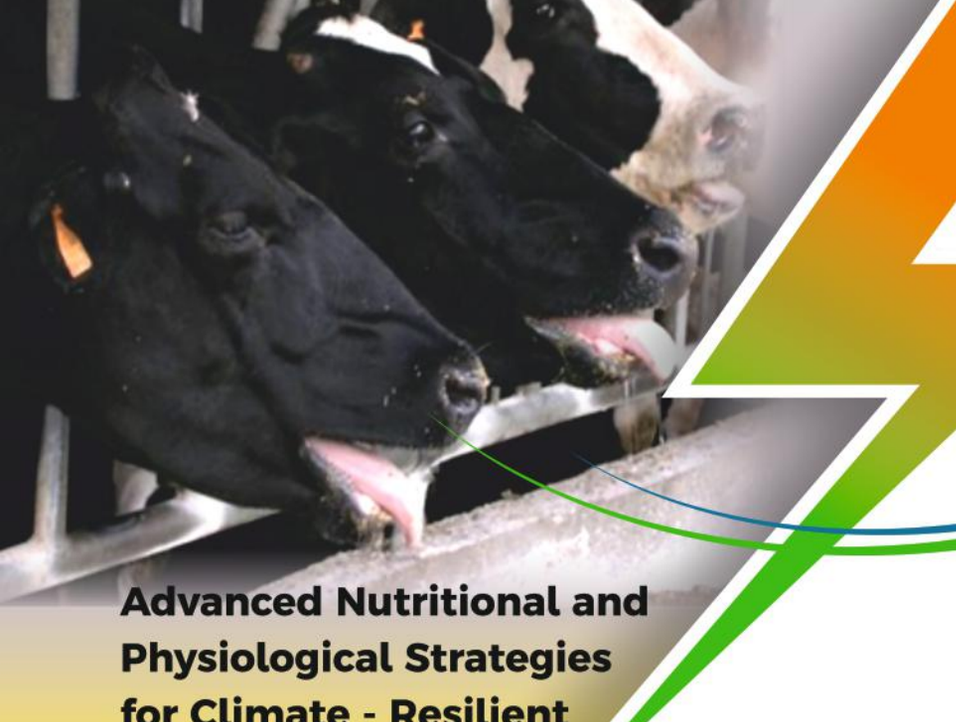
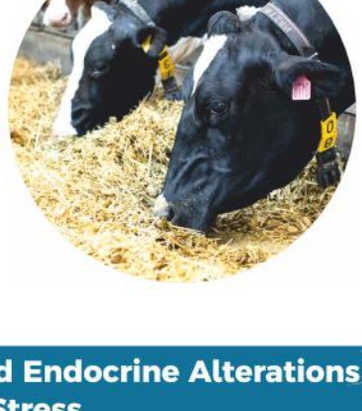
ARTICLE

Heat Stress Management in Dairy Cows:





Advanced Nutritional and Physiological Strategies for Climate - Resilient Dairy Production

Thermoregulatory Physiology in Dairy Cattle

Dairy cows maintain body temperature within a narrow range of 38.5–39.3°C. Thermoregulation relies on several mechanisms including sweating, increased respiration rate, peripheral vasodilation, reduced feed intake, and behavioral adaptations such as standing and seeking shade.

However, when ambient temperature and humidity rise simultaneously, evaporative cooling efficiency declines, making these mechanisms insufficient to maintain normal body temperature.

Heat-stressed cows commonly exhibit respiration rates exceeding 80–120 breaths per minute, rectal temperatures above 39.2°C, reduced rumination, increased standing time, and higher water intake. While these responses help dissipate heat, they significantly increase maintenance energy requirements and reduce nutrients available for milk production.

Metabolic and Endocrine Alterations During Heat Stress

Heat stress triggers major hormonal and metabolic changes that redirect nutrients away from production toward survival and thermoregulation.

One of the most prominent endocrine responses is the activation of the hypothalamic–pituitary–adrenal axis, leading to increased secretion of cortisol. Elevated cortisol suppresses immune function, promotes muscle protein breakdown, and reduces reproductive hormone activity.

Heat-stressed cows also exhibit altered insulin metabolism. Unlike the typical negative energy balance observed in early lactation, heat stress often leads to increased circulating insulin levels and reduced fat mobilization. This metabolic adaptation reduces internal heat production but further exacerbates the cow's energy deficit.

Reproductive hormones are also severely affected. Reduced secretion of luteinizing hormone, estradiol, and progesterone results in poor estrus expression, reduced conception rates, and increased embryonic mortality.

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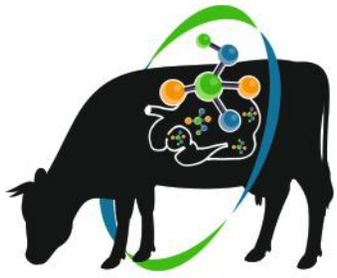
- Fibre digestion
- Milk fat
- Lameness



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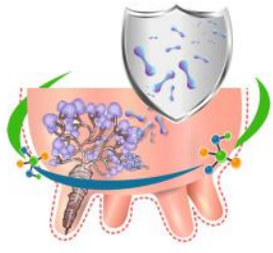

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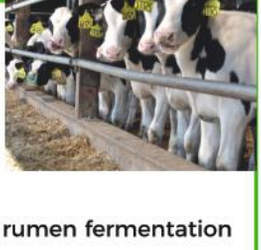
Impact of Heat Stress Across Physiological Stages

Calves

Heat stress during early life negatively affects immune function and growth. Reduced colostrum intake, poor passive immunity transfer, and increased susceptibility to respiratory and enteric diseases are commonly observed. Heat-stressed calves also show reduced starter intake and slower rumen development, which can have long-term consequences on productivity.

Heifers

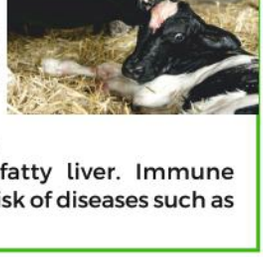


In growing heifers, heat stress reduces feed intake and average daily gain. Hormonal disruptions may delay puberty and negatively affect reproductive development. Chronic exposure to high temperatures also increases oxidative stress and compromises rumen fermentation efficiency.

Dry Cows

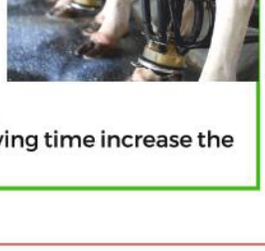
Heat stress during the dry period significantly influences the productivity of the next lactation. Research indicates that cows exposed to heat stress during the dry period may produce 3–5 kg less milk per day in the subsequent lactation. Additionally, heat stress reduces mammary gland cell proliferation and impairs colostrum quality, affecting calf health.

Transition Cows



Transition cows are highly vulnerable due to the combined stress of calving and metabolic adaptation. Heat stress during this stage increases the severity of negative energy balance and raises the incidence of metabolic disorders such as ketosis and fatty liver. Immune suppression further increases the risk of diseases such as metritis and retained placenta.

Lactating Cows



For lactating cows, heat stress directly reduces milk yield and milk component quality. Milk fat and protein percentages often decline due to altered rumen fermentation and reduced nutrient intake. Additionally, prolonged standing and reduced lying time increase the risk of lameness and mastitis.

Glucose Metabolism

Monitor the blood glucose levels regularly as heat stress utilizes most of glucose reserves of the body. Hypoglycemia will lead to inflammatory stress response leading to low immunity, estrous cycle and ovulation issues leading to conception problems. Also, it is very important to note that animal avoids sorting behavior and dry matter intake is managed properly

Mineral and Electrolyte Imbalances

Heat stress causes excessive losses of electrolytes through sweating, urine, and saliva. Key minerals affected include sodium, potassium, magnesium, calcium, and phosphorus.

Sodium and potassium with magnesium balancing are critical for maintaining osmotic balance and nerve function, while magnesium plays an important role in rumen motility and metabolic stability. Calcium depletion may predispose cows to subclinical hypocalcemia, and phosphorus deficiency can impair energy metabolism and fertility.

Potassium deficiency may lead to fat mobilization function in the Rumen leading to low Milk Fat.

Electrolyte balance assist in water intake during heat stress

Maintaining proper electrolyte balance is essential for preserving hydration, acid-base balance, and metabolic stability during periods of thermal stress.

Heat Stress and Gut Integrity

One of the most significant but often overlooked consequences of heat stress is its effect on gastrointestinal integrity. During heat stress, blood flow is redirected away from the digestive tract toward peripheral tissues to facilitate heat dissipation. This reduced blood supply compromises intestinal oxygen delivery and damages epithelial cells.

As intestinal barrier function weakens, tight junction proteins deteriorate, resulting in increased intestinal permeability or "leaky gut." This allows endotoxins such as lipopolysaccharides to enter the bloodstream, triggering systemic inflammation and further reducing productivity.

Role of Functional Feed Additives

Functional feed additives play an important role in supporting digestive health and metabolic resilience during heat stress.

Short chain and medium chain fatty acids, an important energy source for intestinal epithelial cells. They help strengthen the intestinal barrier, improve nutrient absorption, and reduce inflammation.

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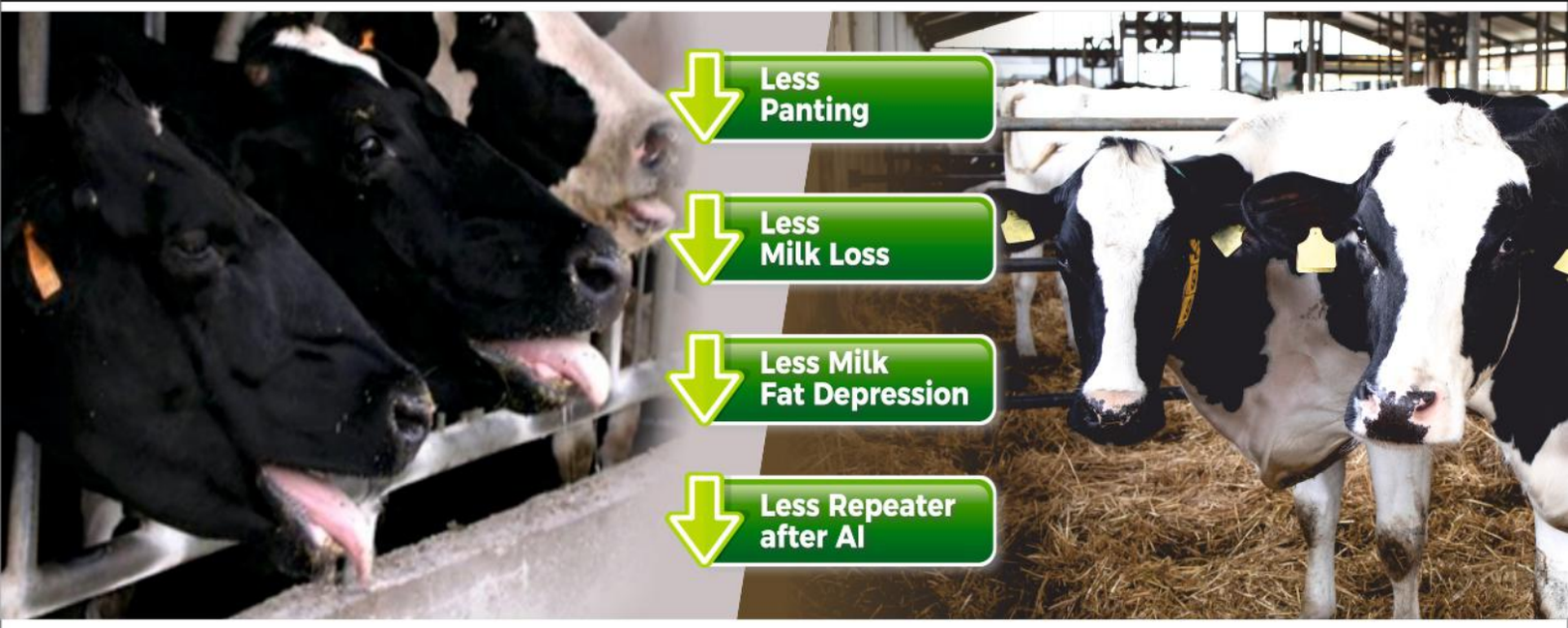

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Yeast cultures and direct-fed microbials are also widely used to stabilize rumen pH, enhance fiber digestion, and improve dry matter intake under stressful environmental conditions.

Advanced Nutritional Strategies for Heat Stress Mitigation

Effective nutritional management is essential to maintain productivity during heat stress.

Increasing dietary energy density helps compensate for reduced dry matter intake. It is better to provide Glucogenic precursors with Niacin which will provide continuous supply of Glucose without increasing fermentation in the Rumen. Niacin helps in better thermos-regulation in the body.

Optimizing fiber quality is also critical. Highly digestible fiber sources maintain rumen function while minimizing heat production during fermentation. Providing blends of fibrolytic enzymes will assist in fibre digestion and maintaining optimal Rumen pH.

Electrolyte supplementation helps replenish losses of sodium, potassium, magnesium, and chloride, supporting hydration and acid-base balance.

Antioxidant supplementation, including vitamin E, selenium, zinc, and vitamin C, helps mitigate oxidative stress caused by elevated metabolic activity.

Rumen-protected protein sources in the feed will further improve protein utilization inside body and support milk production under conditions of reduced feed intake.

Environmental and Management Interventions

While nutritional strategies are important, environmental management remains the most effective way to reduce heat stress.

Cooling systems such as high-speed fans, sprinkler systems, and evaporative cooling pads can significantly reduce body temperature in dairy cows.

Providing adequate shade structures minimizes solar radiation exposure. Feeding during cooler parts of the day, such as early morning or late evening, can improve feed intake.

Water availability is critical, as heat-stressed cows may consume between 100 and 150 liters of water per day. Make sure to provide easy access to water trough and should be provided in adlib

Reducing overcrowding also improves airflow and reduces the accumulation of body heat within housing systems.

Future Perspectives: Climate-Smart Dairy Farming

Climate change is increasing the frequency and intensity of heat stress events, making climate adaptation essential for the dairy industry.

Emerging technologies such as precision livestock monitoring systems allow real-time detection of heat stress through continuous monitoring of respiration rate, activity, and body temperature.

Genetic selection for heat-tolerant animals, improved housing design, and precision nutrition strategies will play increasingly important roles in building climate-resilient dairy production systems.

Conclusion

Heat stress is no longer a seasonal inconvenience but a major biological and economic challenge for modern dairy farming. As global temperatures rise and dairy cows continue to be selected for higher milk production, the gap between metabolic heat generation and the animal's ability to dissipate heat is widening.

The impact of heat stress extends beyond temporary reductions in milk yield. It disrupts endocrine balance, weakens immune function, damages gut integrity, and severely compromises reproductive efficiency. Moreover, exposure during critical stages such as the dry period, transition phase, or early calfhood can have long-lasting effects on productivity and herd health.

Effective mitigation therefore requires a comprehensive and proactive approach that integrates environmental cooling systems, precision nutrition, electrolyte balancing, rumen health management, and the strategic use of functional feed additives. These interventions help maintain metabolic stability, support immune resilience, and sustain nutrient utilization even under challenging climatic conditions.

As climate variability continues to intensify, dairy farms must adopt climate-smart management strategies that combine advanced nutritional programs with improved housing and monitoring technologies. Farmers who implement these integrated approaches will be better positioned to safeguard animal welfare, maintain milk production, and protect long-term farm profitability.

Ultimately, managing heat stress is not only about preventing losses—it is about building climate-resilient dairy production systems capable of sustaining high levels of performance in an increasingly unpredictable environment.

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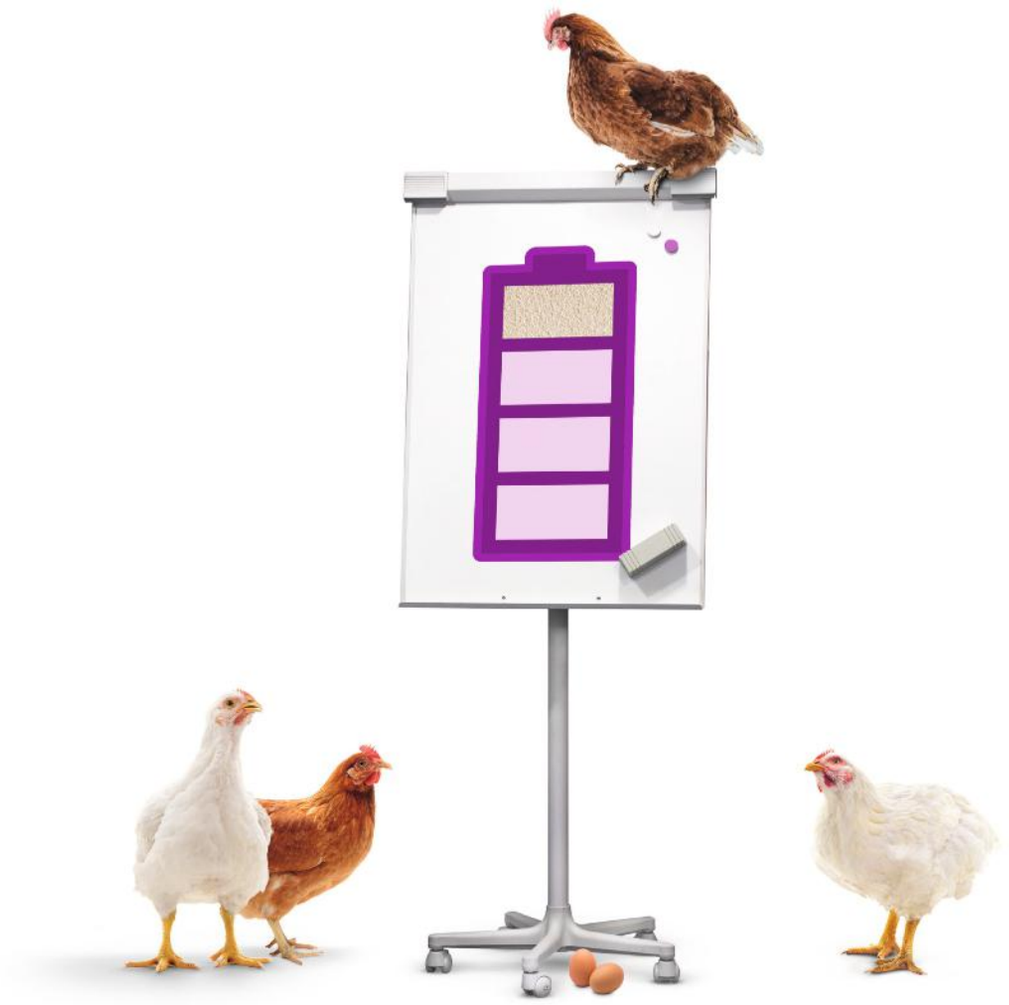

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ARTICLE

Biochemical Indicators of Ketonuria in Dairy Animals Diagnostic Approaches and Clinical Relevance during Early Lactation

Jitendra K.,Ph.D *[1], Haribrahma Singh [2] & Murli Dhar Mitra[3], Vedvrat Singh[4]

Introduction

Ketonuria is a metabolic disorder resulting from negative energy balance during early lactation. It occurs when the energy demand for milk production exceeds dietary energy intake, leading to increased mobilization of body fat. Under normal physiological conditions, mobilized fatty acids are completely oxidized to carbon dioxide and water; therefore, only negligible amounts of ketone bodies are excreted in urine. However, when the rate of ketone body production exceeds their utilization, excess ketone bodies are eliminated through urine, a condition referred to as ketonuria. In high milk-yielding dairy animals, ketonuria-the presence of excessive ketone bodies (acetone, acetoacetate, and ß-hydroxybutyric acid) in urine, key indicator of ketosis. This metabolic disorder typically occurs during the first 1-8 weeks postpartum, most commonly between 1 and 4 weeks after calving, and results from a negative energy balance (Ospina *et al*, 2010).

Fig.1 Schematic illustration of ketonuria during early lactation in high-yielding dairy animals.

Key Aspects of Ketonuria in High-Yielding Dairy Animals

Underlying Cause: It results from excessive body fat mobilization because the energy required for high milk production exceeds energy intake.

Production Link: The incidence of ketosis is highest in high-producing cows, particularly in the first 1-2 months after calving, with up to 50% of cows in high-yield herds potentially experiencing subclinical ketosis.

Subclinical or Clinical: Ketonuria can be present without visible signs (subclinical) or with symptoms like decreased appetite, rapid weight loss, and reduced milk yield (clinical).

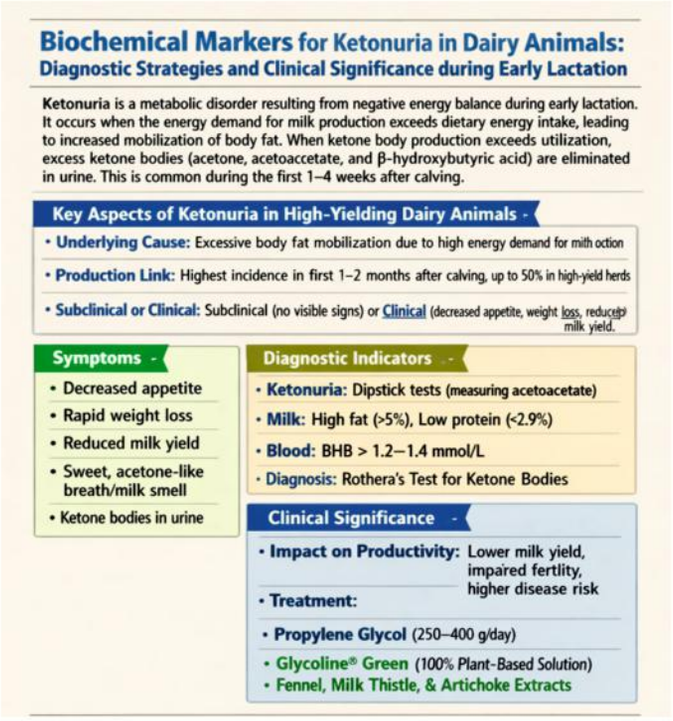
Fig2. Overview of ketonuria in dairy animals.

Symptoms

- Decreased appetite
- Rapid weight loss
- During early lactation reduced milk yield
- Sweet, acetone-like breath/milk smell
- Ketone bodies are eliminated in urin

Diagnostic Indicators

Ketonuria: Detected via dipstick tests@ (measuring acetoacetate)



Milk: Elevated fat content (>5%) and lowered protein (<2.9%) indicate a high fat-to-protein ratio, suggesting ketosis.

Blood: Beta-hydroxybutyrate (BHB) levels exceeding 1.2-1.4 mmol/L define hyperketonemia.

Fig 3. Diagnostic indicators of ketonuria and ketosis in dairy animals.

Diagnosis@: Rothera's Test for Ketone Bodies (dipstick tests)

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Rothera's Test for Detection of Ketone Bodies in Urine

Rothera's test is a qualitative nitroprusside-based reaction used for the detection of ketone bodies, particularly acetoacetic acid and acetone, in urine. In the presence of sodium nitroprusside and an alkaline medium, acetoacetate reacts to produce a purple-colored complex Sodium nitroprusside-acetoacetate (Tietz, 2018; Varley et al., 1988).

Procedure

1. **Sample Preparation**

   Take 5 mL of freshly collected urine in a clean, dry test tube.

2. **Saturation Step**

   Add solid ammonium sulfate gradually to the urine until saturation is achieved (i.e., no further dissolution occurs). This enhances test sensitivity by concentrating ketone bodies.

3. **Addition of Nitroprusside**

   Add 2-3 drops of freshly prepared sodium nitroprusside solution and mix thoroughly.

4. **Alkalinization**

   Carefully add 1-2 mL of concentrated ammonium hydroxide (liquor ammonia) along the inner wall of the test tube to form a distinct upper alkaline layer.

5. **Observation**

   Examine the junction between the two liquid layers for the appearance of a purple or permanganate-colored ring within a few minutes.

Interpretation of Results

- **Positive Result**

  Development of a purple or violet ring at the interface indicates the presence of ketone bodies (mainly acetoacetate and acetone).

- **Negative Result**

  Absence of a purple ring suggests no detectable ketone bodies.

- **Semi-Quantitative Grading**

  The intensity of the purple coloration may be graded as: Trace (+/-), +, ++, +++, or ++++ (deep purple), reflecting increasing ketone concentration.

Key Considerations

- **Sensitivity and Specificity**

  The test is sensitive to acetoacetic acid and acetone but does not detect ß-hydroxybutyrate, the predominant ketone body in severe ketosis (Tietz, 2018).

- **Reagent Freshness**

- Sodium nitroprusside solution should be freshly prepared to ensure optimal sensitivity and reliability.

- **Alternative Format**

  A dry powdered mixture containing sodium nitroprusside and ammonium sulfate (Rothera's mixture) may be used as a convenient alternative (Varley et al., 1988).

Clinical Significance

Impact on Productivity: Untreated ketonuria leads to significant economic losses, including lower milk yield (often 2-3 kg less per day), impaired reproductive performance (delayed conception), and increased risk of diseases like displaced abomasum.

Treatment: Oral administration of glucose precursors, such as **propylene glycol** (250-400 g/day), is the most effective treatment to re-establish normal blood glucose levels. **Propylene Glycol (Plant-Derived):** Glycoline® Green is a 100% plant-based solution derived from vegetable oils, functioning as a glucose precursor to reduce ketones. It is considered highly effective when administered orally. Extracts of **fennel, milk thistle, and artichoke** are used to manage ketosis.

Conclusion

Ketonuria is a significant metabolic disorder of high-yielding dairy animals during early lactation, primarily resulting from negative energy balance (During early lactation, the energy demand for milk production often exceeds the energy provided through dietary intake). Excessive mobilization of body fat and incomplete oxidation of fatty acids lead to overproduction of ketone bodies, which are excreted in urine and serve as an early indicator of ketosis. Prompt diagnosis through urine dipstick tests, milk fat-to-protein ratio assessment, and blood ß-hydroxybutyrate estimation is essential for effective management. Early intervention with glucose precursors and nutritional correction can minimize production losses, improve reproductive performance, and reduce the risk of secondary metabolic disorders, thereby enhancing overall herd health and economic sustainability.

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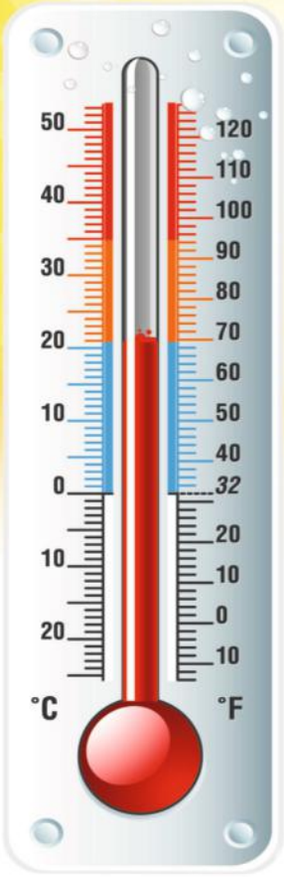
Temperature is rising...



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€ EU approved for use in bovine destined for milk and meat production, dairy goats, dairy ewes and lambs (E1711/4a1711/4b1711). Not all products are available in all markets nor associated claims allowed in all regions.

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The level and impact of heat stress on cows is influenced by a combination of ambient temperature and relative humidity. New research has shown that temperatures in excess of 20°C and 50% relative humidity[2] will lead to cow discomfort and reduced milk production.

1 Saint Pierre et al., 2003 - 2 Burgos & Collier, 2011.

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**Marfola, et al, ADSA 2010.*

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DR. CARLOS CAMPABADAL

Faculty Member, Department of Grain Science and Industry, Kansas State University

Dr. Carlos Campabadal is a faculty member at the Department of Grain Science and Industry at Kansas State University focusing his work on the International Grains Program Institute (IGP) as an extension specialist and leader focused on outreach in the areas of grain storage, quality and processing, U.S. grain grading, export systems, and feed manufacturing. He conducts applied research in stored product protection focusing on grains, oilseeds and its co-products. He is active in international development with several projects with USAID and USDA in Central America and in Africa. He was born and raised in Costa Rica, Central America.

He obtained his doctoral degree in Agricultural and Biological Engineering from Purdue University focusing on Stored Product Protection and was a part of the Post-Harvest Education and Research Center (PHERC). He obtained his master's degree in Agricultural Engineering at the University of Illinois focused on grain processing. Before, his graduate studies and after obtaining a B.S. degree in Mechanical Engineering from the University of Costa Rica, he worked in his family feed mill company for three and a half years as a process and maintenance engineer. His previous experience includes animal farm management in beef cattle and swine farms. Dr. Carlos has travelled throughout Latin America, Africa, Asia, and Europe as a technical consultant, and speaker in more than 35 countries and 50 short courses and seminars in the areas of grain storage and feed manufacturing for U.S. Grains Council, U.S. Soybean Export Council, U.S. Wheat Associates, USDA, WISHH, World Bank, and private companies. He has also presented his research at several scientific and professional conferences, and has several publications in scientific journals. He is still involved in his family feed manufacturing and farm business operations.

DR. WILMER JAVIER PACHECO

Extension Specialist and Associate Professor, Department of Poultry Science, Auburn University

Dr. Wilmer Pacheco was born in Honduras where he obtained a BS in Food Science in 2005. Shortly after graduation, Dr. Pacheco began a feed mill manager training program with Murphy Brown, LLC in Laurinburg, North Carolina where he was responsible for overseeing the production of approximately 10,000 tons of pellet feed per week. In June 2009, Dr. Pacheco was awarded a fellowship in the Department of Poultry at North Carolina State University, where he earned his Master's in Poultry Science and his Ph.D. in Physiology and Nutrition. Currently, Dr. Pacheco is an Associate Professor and Extension Specialist at Auburn University in the State of Alabama. His research activities are focused on understanding the interrelationships between feed processing and nutrition on broiler performance. Additionally, Dr. Pacheco conducts research on nutrition strategies to reduce production costs, improve broiler performance, and nutrient digestibility. Dr. Pacheco is lead or supporting author of 32 research articles and 88 news articles primarily in Feedstuffs magazine, which is the leading source of news for animal agriculture in the United States with 12,500 accredited subscribers. Dr. Pacheco has been invited to give more than 165 presentations in 16 countries, has served as chair or member of 25 graduate student committees, and has mentored 21 visiting scholars from 12 countries.

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MR. MEENAKSHISUNDARAM KANAGARAJ

Consultant

Mr. Meenakshisundaram Kanagaraj is a freelancing consultant, technical trainer, and speaker on feed milling. He holds a Post Graduate Diploma in Digital Instrumentation and a Bachelor's degree in Physics. He has worked for an instrumentation company, an auto ancillary components manufacturer, and a multinational animal feed additive manufacturer. He has successfully completed a course on Lean Six Sigma Black Belt by the American Society for Quality (ASQ) and a course on Fundamentals of Feed Milling Technology conducted by the American Feed Industry Association (AFIA). As a consultant, he is involved in new feed mill projects from design to commissioning. He has helped feed milling organizations improve quality and productivity.

What SEC Members Have to Say

Dr. Vaibhav Deshmukh
Assistant General Manager
Venkateshwara Hatcheries Pvt. Ltd.

"The SEC India Poultry Production & Management Course was a very enriching learning experience for me. It helped me strengthen my understanding of poultry production while also giving me practical insights that are useful in day-to-day professional work. The sessions were interactive and provided a great opportunity to learn from industry experts as well as connect with fellow professionals. I especially appreciated how the course combined theoretical knowledge with practical industry applications. Overall, the program enhanced my confidence and analytical thinking. I would certainly recommend this course to anyone in the poultry industry who wants to update their knowledge and grow professionally."

Dr. Gajanan Solanke
Technical Executive (TE)
Virbac Animal Health India Pvt. Ltd.

"The SEC India Poultry Production & Management Course significantly enhanced my technical knowledge in poultry production, nutrition, and disease management. The course was very well structured, and the experts explained the topics clearly with practical examples, making the sessions highly informative and easy to understand. I particularly valued the insights into poultry nutrition, soybean meal utilization, and the importance of biosecurity and farm management in improving flock productivity. The training provided strong practical understanding that can be directly applied in field conditions. I would definitely recommend this course to poultry professionals seeking practical and industry-relevant knowledge."

सोशल मीडिया पर पशु चिकित्सा ज्ञान का औचित्य

डॉ. कृष्णकांत कुमार, संयुक्त सचिव

"मुंडे मुंडे मतिरभिन्ना" यानी हर व्यक्ति के विचार अलग–अलग होते हैं। किसी एक विषय पर जब अपनी सोच के अनुरूप अपनों का विचार होता है, तो मन में संतोष का भाव होता है। परंतु जब अपनों का विचार अपनी सोच से भिन्न होता है, तो मन में कुछ व्यग्रता और असंतोष का भाव पैदा होता है। यह प्रत्येक मानव का स्वाभाविक गुण है। जब अपने पेशेवर बंधुओं की सोच पेशे की मान–मर्यादा और प्रतिष्ठा के प्रतिकूल होती है, तो अपने अंतस्तल में भावनाएं काफी उद्वेलित होती हैं। हांलाकि उनके कार्य कलाप उनके विचार के अनुसार सही होते होगें। प्रस्तुत लेख हमारी सोच के मुताबिक पशु चिकित्सा की हमारी अहर्ता पर आधारित है। अपनी सोच और संवेदना को पशु चिकित्सक समाज तक पहुँचाना इस लेख का उद्देश्य है। प्रस्तुत लेख में व्यक्त विचार से आप किस हद तक सहमत होंगे, यह पता नहीं। परन्तु इस लेख का उद्देश्य सिर्फ अपनी सोच, भावना और संवेदना को शब्दों में पिरोकर आपके विचारार्थ आप तक पहुंचाना है।

वर्तमान समय में ऐसा देखने में आ रहा है कि कुछ पशु चिकित्सकों द्वारा सोशल मीडिया यथा यूट्यूब, फेसबुक इत्यादि पर अपनी लोकप्रियता हासिल करने अथवा अप्रत्यक्ष रूप से अर्थोपार्जन के लिए पशु चिकित्सा से संबंधित ज्ञान का प्रदर्शन किया जा रहा है। आज का विषय इसी तथ्य पर आधारित है।

ऐसा प्रतीत होता है कि उनके द्वारा यह विचार नहीं किया जा रहा है कि यूट्यूब पर उनके द्वारा बांटा जाने वाला ज्ञान किस पात्र को जा रहा है या इस ज्ञान को प्राप्त करने वाले पात्र इसे किस रूप में उपयोग करेंगे, इस संबंध में इन युटयुबर्स को चिंता नहीं होती है। उनकी चिंता सिर्फ अपने भिउवर यानी दर्शकों की संख्या बढ़ाने की होती है। जिससे कि उन्हें अधिक से अधिक अर्थ लाभ हो सके।

सोशल मीडिया पर पशु चिकित्सा जगत के सामान्य अथवा विभिन्न विषयों के विशेषज्ञ यूट्यूब पर काफी सक्रिय हैं। इसमें तथाकथित सर्जन से लेकर मेडिसिन के प्रोफेसर तक शामिल हैं। हमारे देश में बिहार सहित कई अन्य राज्यों में मेडिकल फील्ड के साथ–साथ पशु चिकित्सा क्षेत्र में काफी संख्या में ग्रामीण झोलाछाप पशु चिकित्सक कार्यरत हैं और वह यूट्यूब पर पशु चिकित्सा संबंधी जानकारी को देख और सुनकर चिकित्सा करते हैं। अभी हाल में ही एक उदाहरण हमारे सामने आया है। इसमें यूट्यूब पर सिजेरियन सेक्शन का वीडियो देखकर एक झोलाछाप डॉक्टर ने एक गर्भवती महिला की सिजेरियन सेक्शन ऑपरेशन कर दिया। तकनीकी जानकारी के अभाव में ऑपरेशन किए जाने से उस महिला की मौत हो गई। यहां इन युटयुबर्स पशु चिकित्सकों को इस बात की कोई चिंता नहीं है कि नीम हकीम चिकित्सा का पशु स्वास्थ्य पर क्या प्रभाव पड़ रहा है? मेरे विचार में पशुओं अथवा मनुष्यों की जान और उनके स्वास्थ्य पर नीम हकीम चिकित्सा का उपयोग गैरकानूनी और एक क्रूर कार्य है। इन युटयुबरों को सोचना चाहिए कि उनके द्वारा मूलतः अर्थोपार्जन के उद्देश्य से प्रदर्शित किए जा रहे इस ज्ञान का कहीं दुरुपयोग तो नहीं हो रहा है? कहने को तो इन युटयुबर्स का उद्देश्य पशु चिकित्सा का विकास, प्रचार तथा अद्यतन ज्ञान देना होता है। परंतु वास्तव में इसके पीछे उनका निजी स्वार्थ यथा दर्शकों की संख्या बढ़ाना और अर्थोपार्जन करना होता है। उनके द्वारा यह कहना कि मेरे इस ऐप को लाइक करें सब्सक्राइब करें तथा निर्धारित राशि का भुगतान कर सदस्यता ग्रहण कर लें– यह उनके द्वारा सस्ती लोकप्रियता हासिल करने तथा अर्थोपार्जन की प्रवृत्ति का द्योतक है। यहां यह कहना अत्यंत समीचीन होगा कि क्षेत्रीय स्तर पर पशु चिकित्सा विज्ञान के उपयोग के लिए जवाबदेह हमारी राष्ट्रीय विधिक संस्था "भारतीय पशु चिकित्सा परिषद" अथवा राज्य स्तरीय "राज्य पशु चिकित्सा परिषद" अयोग्य एवं अप्रशिक्षित ग्रामीण झोलाछाप पशु चिकित्सकों के द्वारा वृहत पैमाने पर ग्रामीण क्षेत्रों में किये जा रहे पशु चिकित्सा के प्रति क्यों चुप्पी साध रखा है और मौन है।

विधि द्वारा निर्धारित शैक्षणिक योग्यता प्राप्त करने के बाद कठिन प्रतियोगी परीक्षा में सफल होकर कोई छात्र पशु चिकित्सा और पशुपालन अथवा चिकित्सा शिक्षा इत्यादि पाठ्यक्रम के डिग्री कोर्स में नामांकन के लिए चयनित होता है। तदुपरांत लंबी अवधि के सैद्धांतिक, प्रायोगिक और इंटर्नशिप का कोर्स पूरी करने के बाद उन्हें पशु चिकित्सा विज्ञान की डिग्री प्राप्त होती है। तत्पश्चात् भारतीय पशु चिकित्सा परिषद अथवा राज्य पशु चिकित्सा परिषद द्वारा निर्धारित मापदंड पर खरा उतरने के बाद ही उन्हें पशु चिकित्सा कार्य के लिए वैधानिक मान्यता एवं अनुमति दी जाती है। इस प्रकार प्राप्त ज्ञान को यूट्यूब सोशल मीडिया पर चिकित्सा का वीडियो किसी अपात्र को दिखाकर क्षेत्र में पशु चिकित्सा कार्य के लिए प्रोत्साहित किया जाना कहां तक उचित है? कठिन परिश्रम और लंबी अवधि की पढ़ाई से प्राप्त योग्यता को इतनी सस्ती बनाई जा रही है। रोगों से संबंधित बचाव के तरीके यानी प्रोफालैक्सिस मेजर को सोशल मीडिया के माध्यम से जन–जन तक पहुंचाने की बात समझ में आती है और यह उचित भी है। परंतु पशु चिकित्सा के गंभीर विषयों (सर्जरी सहित) पर वीडियो के माध्यम से सोशल मीडिया पर ज्ञान देना कहां तक उचित है? सिर्फ "अमुक दवा का उपयोग या अमुक चिकित्सा किसी योग्य पशु चिकित्सक की देखरेख में ही किया जाना चाहिए" कहने भर से अपने कर्तव्य की इति श्री नहीं हो जाती है और यह सिर्फ अपनी कमियों को छिपाने की चेष्टा है। क्यूरेटिव मेजर्स के रूप में क्लिष्ट सर्जरी का प्रदर्शन, एंटीबायोटिक या अन्य प्रतिबंधित दवाओं/औषधियों का उपयोग, फार्मोकोलॉजी और पैथोजेनेसिस की चर्चा भी पशु चिकित्सा ज्ञान का विस्तार नहीं हो सकता है। सोशल मीडिया पर दिखाई जा रही इन युटयुबरों में से कुछ की बातें ज्ञानवर्धक हो सकती है, बशर्ते कि पात्र श्रोता अथवा दर्शक हों।

इस प्रकार के महत्वपूर्ण ज्ञान के प्रचार– प्रसार के लिए वर्कशॉप, सेमिनार अथवा डिबेट उचित फोरम हो सकता है, जहां श्रोताओं/दर्शकों की एक मानक श्रेणी होती है। सोशल मीडिया का खुला मंच इसके लिए उचित प्लेटफॉर्म नहीं हो सकता है, जहां श्रोताओं अथवा दर्शकों का कोई निर्धारित मापदंड अथवा पात्रता नहीं होती है।

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यहां इस ज्ञान के दुरुपयोग की संभावना ही ज्यादा है। आधी–अधूरी ज्ञान के नीम हकीमी उपयोग का पशु स्वास्थ्य पर अत्यंत गंभीर दुष्प्रभाव ही होता है। कोई सही ज्ञान अगर गलत हाथों में जाता है, तो इसका दुरुपयोग ही ज्यादा होता है। पशु चिकित्सा पेशा के लिए लिया जाने वाला Oath और इस पेशा का Ethics पशु चिकित्सकों को इस बात की अनुमति नहीं देता है कि उनके ज्ञान का उनके द्वारा या उनके माध्यम से किसी अपात्र के द्वारा दुरुपयोग किया जाए और यह भारतीय पशु चिकित्सा परिषद के विधिक प्रावधानों का उलंघन भी माना जा सकता है।

इस प्रकार के महत्वपूर्ण ज्ञान के प्रचार– प्रसार के लिए वर्कशॉप, सेमिनार अथवा डिबेट उचित फोरम हो सकता है, जहां श्रोताओं/दर्शकों की एक मानक श्रेणी होती है। सोशल मीडिया का खुला मंच इसके लिए उचित प्लेटफॉर्म नहीं हो सकता है, जहां श्रोताओं अथवा दर्शकों का कोई निर्धारित मापदंड अथवा पात्रता नहीं होती है। यहां इस ज्ञान के दुरुपयोग की संभावना ही ज्यादा है। आधी–अधूरी ज्ञान के नीम हकीमी उपयोग का पशु स्वास्थ्य पर अत्यंत गंभीर दुष्प्रभाव ही होता है। कोई सही ज्ञान अगर गलत हाथों में जाता है, तो इसका दुरुपयोग ही ज्यादा होता है। पशु चिकित्सा पेशा के लिए लिया जाने वाला Oath और इस पेशा का Ethics पशु चिकित्सकों को इस बात की अनुमति नहीं देता है कि उनके ज्ञान का उनके द्वारा या उनके माध्यम से किसी अपात्र के द्वारा दुरुपयोग किया जाए और यह भारतीय पशु चिकित्सा परिषद के विधिक प्रावधानों का उलंघन भी माना जा सकता है।

इस लेख का उद्देश्य पशु चिकित्सा एवं पशु चिकित्सकों की योग्यता और महत्व को अक्षुण्ण रखने का प्रयास भर है। भारत सरकार और बिहार सरकार द्वारा ''कौशल विकास मिशन'' के तहत विभिन्न क्षेत्रों में कौशल विकास और स्वरोजगार हेतु कई प्रशिक्षण संस्थान खोले गए हैं। ग्रामीण क्षेत्रों में पशुओं के प्राथमिक चिकित्सा हेतु पाराभेट्स के प्रशिक्षण के लिए कई संस्थान खोले गए हैं, जहां पशुओं की प्राथमिक चिकित्सा के लिए युवकों को गंभीरता पूर्वक प्रशिक्षित किया जाता है। वहां तीन महीने से लेकर एक साल तक का प्रशिक्षण देकर पाराभेट्स को ग्रामीण क्षेत्रों में पशुओं की प्राथमिक चिकित्सा हेतु प्रशिक्षित किया जाता है।

बिहार के एक दैनिक समाचार पत्र में छपी एक खबर के अनुसार यूजीसी यानी यूनिवर्सिटी ग्रांट कमीशन ने कुछ एक संस्थाओं द्वारा संचालित मनोविज्ञान, Health Care, Microbiology, Food & Clinical Nutrition जैसे महत्वपूर्ण विषयों की ऑनलाइन पढ़ाई पर रोक लगा दी है। यूजीसी द्वारा लगाया गया यह प्रतिबंध National Commission for Applied and Health Care Professionals Act 2001 के प्रावधान के अनुसार बताया गया है। यद्यपि इसमें पशु चिकित्सा विज्ञान जैसे विषय का वर्णन नहीं किया गया है, परंतु इतना मानना होगा कि जिस पाठ्यक्रम में सैद्धांतिक, प्रायोगिक और इंटर्नशिप जैसे पहलू शामिल है, उनकी पढ़ाई की व्यवस्था ऑनलाइन नहीं होकर संस्थागत ही होनी चाहिए। पशुओं की बहुत सारी बीमारियां Zoonotic Nature के होने के कारण यह सीधे मानव स्वास्थ्य से संबंधित होता है। विश्व स्वास्थ्य संगठन के 2023 के रिपोर्ट के अनुसार जीवाणुओं से संक्रमित दुनिया भर के हर छः में से एक रोगी पर एंटीबायोटिक बेअसर सिद्ध हो रहा है। Global Antibiotics Resistance Surveillance, 2025 के अनुसार दक्षिण पूर्व एशिया (जिसमें भारत भी है) में लगभग हर तीन में से एक रोगी में एंटीबायोटिक रेजिस्टेंस की समस्या है। विशेषज्ञों ने चेतावनी दी है कि यदि एंटीबायोटिक के बेहतरीन प्रयोग/उपयोग पर कड़े कदम नहीं उठाए गए, तो आने वाले वर्षोंमें ड्रग रेजिस्टेंस की यह समस्या और भी गंभीर रूप ले सकती है।

प्रत्येक वर्ष 18–24 नवंबर के बीच विश्व स्वास्थ्य संगठन (WHO) की ओर से "Antimicrobial Resistance Awareness Week" का आयोजन किया जाता है। जिसका उद्देश्य एंटीबायोटिक के अनावश्यक उपयोग को रोकना तथा उनसे उत्पन्न होने वाली समस्याओं के प्रति जन जागरूकता पैदा करना है। गत दिनांक 26 नवंबर 2025 को इंदिरा गांधी आयुर्विज्ञान संस्थान, पटना में आयोजित एक सेमिनार में बताया गया कि बिहार में "Antibiotics Resistance" की समस्या अन्य राज्यों की तुलना में अधिक है। Self & Medication, Quake Practice, Over the Counter दवा का विक्रय इसका प्रमुख कारण बताया गया है। सोशल मीडिया पर वेटरनरी प्रैक्टिस में Curative Measures पर दिया जाने वाला ज्ञान तथा Surgical Procedures का प्रदर्शन उपर्युक्त समस्या का एक कारण हो सकता है।

पशु रोगों के जूनोटिक महत्व के कारण पशु चिकित्सा व्याख्यान का यह विषय सीधे मानव स्वास्थ्य से जुड़ा हुआ है। यह भी ध्यान देने योग्य है कि अभी भी आम पशुपालक अपने बीमार पशुओं की चिकित्सा हेतु मानव चिकित्सा की भांति इधर–उधर की दौड़ लगाने में असमर्थ होते हैं। इसलिए Prophylactic Measures के बदले Curative Measures पर विद्वानों का व्याख्यान तथा Surgical Measures का सोशल मीडिया पर प्रदर्शन किसी भी रूप में सही नहीं ठहराया जा सकता है।

बिहार पशु विज्ञान विश्वविद्यालय, बिहार, पटना द्वारा 17 प्रकार की शॉर्ट टर्म संस्थागत कोर्स प्रारंभ किए जाने के उद्घाटन सत्र में 30 अगस्त 2025 को विश्वविद्यालय के विद्वान कुलपति माननीय डॉक्टर इंद्रजीत सिंह का यह उद्गार ''अयोग्य और बिना डिग्री वाले भेट्स प्रैक्टिशनर्स द्वारा किया जाने वाला चिकित्सा का पशु स्वास्थ्य पर अत्यधिक दुष्प्रभाव होता है'' विषय की गंभीरता को दर्शाता है। इस प्रकार की चिकित्सा कानूनी और पशु स्वास्थ्य की दृष्टिकोण से उचित नहीं है। सोशल मीडिया पर सक्रिय इन पशु चिकित्सकों के द्वारा इस विषय पर स्वतः संज्ञान लेने और विश्लेषण करने की आवश्यकता है।

सारांशतः पशु चिकित्सा के मामले में अंगीभूत तथा प्रस्वीकृत संस्थाओं के अतिरिक्त/इतर सोशल मीडिया पर दिया जाने वाला ज्ञान पशु चिकित्सकों की गरिमा और उनके एथिक्स के अनुकूल नहीं है। पशु चिकित्सकों को स्वयं इस विषय पर गंभीरता से विचार करना चाहिए और नीम हकीम झोलाछाप ग्रामीण पशु चिकित्सकों से पशुपालकों को बचाने की हर संभव कोशिश होनी चाहिए। इस लेख में व्यक्त विचार से सहमत या असहमत होना पाठकों की सोच पर निर्भर है। इसका उद्देश्य किसी की व्यक्तिगत भावना को चोट पहुंचाना नहीं है।

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Avitech Nutrition showcases

its innovative product range at the 19th PDFA International Dairy & Agri Expo 2026 at Jagraon Ludhiana

Avitech
Knowledge | Nutrition | Innovation

Avitech Nutrition, a leading name in high-performance feed additives, successfully showcased its comprehensive product portfolio at the 19th PDFA International Dairy & Agri Expo, held from February 7th to 9th, 2026, at the Cattle Fair Ground at Jagraon, Ludhiana.

As the dairy industry moves toward more science and efficiency-driven practices, the PDFA Expo represents a platform for stakeholders to exchange knowledge and witness innovation. Avitech Nutrition utilised the event to engage directly with dairy farmers, entrepreneurs, and industry experts, underlining its commitment to the cattle sector.

The meaningful exchanges during the expo further strengthened Avitech Nutrition's connection with customers and industry partners, reflecting a shared commitment to advanced and reliable nutrition solutions for the dairy industry.

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Advancing Animal Welfare and Performance with Phytogenics

TECHNA
Smart Feed & Good Health

Jihane Guihard
R&D Project Manager
Techna

Samira El Mafadi Jian
Product Development Officer
Techna

In modern production systems, farm animals face multiple stressors, such as heat, density, transport, and weaning, that compromise welfare, immunity, and performance. These challenges not only affect behavior and productivity but also lead to economic losses and raise consumer concerns about animal welfare and sustainable practices. By offering a multi-faceted and natural approach, phytogenics emerge as a relevant and sustainable strategy to improve performance, while contributing to overall health and enhanced animal welfare.

PHYTOGENICS: WHAT ARE THEY? Phytogenics, also known as "phytobiotics" or "phytogenic feed additives", are derived from various parts of plants like herbs, spices and plant extracts and contain a vast array of bioactive compounds such as polyphenols, flavonoids or alkaloids.

These compounds exert their beneficial effects through multiple mechanisms, directly impacting key physiological systems and health status:

Botanicals and spices: Such as oregano, ginger and garlic, used for their aromatic, savory, or biological properties.

Plant extracts: Complex mixtures of active compounds obtained from various parts of plants (roots, leaves, flowers, fruits), for specific active components like flavonoids, saponins, or alkaloids.

Essential oils: Concentrated liquids containing volatile compounds from plants (e.g., carvacrol from oregano, thymol from thyme, cinnamaldehyde from cinnamon), extracted through distillation or mechanical pressing.

The efficacy of phytogenics comes from their diverse array of key active principles and their complex mechanisms of action. These compounds work synergistically to exert a multitude of beneficial effects within the animal's body:

Antioxidant properties: Many phytogenic compounds, such as polyphenols and flavonoids, are powerful antioxidants. They neutralize free radicals, reducing oxidative stress in animals, which can be particularly high during periods of stress, rapid growth, weaning or disease challenges. This helps to protect cells and tissues from damage, improving overall health and resilience.

Antimicrobial activity: Essential oils and plant extracts often exhibit broad-spectrum antimicrobial properties against various bacteria, fungi, and viruses. This can help to control pathogenic microbial populations in the gut, reducing the incidence of enteric diseases and promoting a balanced gut microbiome.

Improved digestibility and nutrient absorption: Some phytogenics stimulate the secretion of digestive enzymes and support gut morphology (villus height, crypt depth...). This leads to better digestion and absorption of nutrients from the feed, translating into improved feed efficiency and growth performance.

Intake stimulation: The aromatic compounds in essential oils can enhance the palatability of feed, encouraging higher feed intake, especially during stressful periods or transitions, thereby supporting consistent growth.

Stress management: Certain botanicals, such as passion flower, contribute significantly to improving animal well-being. They may exhibit anxiolytic and calming effects by modulating neurotransmitter systems like the GABAergic system. Their ability to support the antioxidant and natural defense system also help mitigate the negative effects of stress. By reducing the overall stress load on animals, phytogenics can lead to improved behavioral well-being, promoting more natural and less aggressive interactions and contributing to a calmer and more harmonious environment within the animal group.

TECHNA'S EXPERTISE IN FORMULATING SOLUTIONS

At Techna, we use a science-driven approach to developing phytogenic products. The methodology is rooted in a deep understanding of botanicals, animal physiology, and the specific challenges faced by agricultural production sectors.

Techna develops phytogenic feed additives by starting in the field, with the identification of specific zootechnical or health problems. The scientific team, composed of veterinarians and animal nutritionists, works closely with farmers and animal specialists to understand the precise challenges faced by animals. This real-world insight guides the research and development, ensuring the solutions directly address the problematics on the ground.

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Independent health and nutrition expert group

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The core of the expertise lies in the in-depth knowledge of over 100 active ingredients. The botanical experts possess an extensive understanding of plant biochemistry and physiology, knowing the active compounds responsible for biological effects and the most potent parts of plants.

The development process is backed by rigorous scientific research, which is continuously updated through ongoing research and analysis. It also includes collaborations with universities and research institutes for in-vitro trials, to measure biological indicators and biochemical effects of individual active substances. This allows not only to select the most active components, but also to understand the precise mechanism of action by which the phytogenics exert their benefits.

This expertise draws on decades of mastery in the synergy of botanical components. The individual active components and botanicals are combined to create sophisticated blends where compounds interact to enhance each other's efficacy, often leading to more potent and balanced outcomes than single-ingredient approaches.

These product combinations are tested in vivo through research programs and in experimental stations, as well as approved in commercial field trials to confirm their zootechnical benefits under diverse practical conditions.

In addition, Techna works on designing optimal delivery methods to ensure maximum bioavailability and efficacy within the animal.

ENCAPSULATION OF PLANT-BASED ACTIVES

Techna has developed expertise in protecting and delivering natural active ingredients with precision. This capability is a key differentiator, as the encapsulation of these compounds plays a strategic role in ensuring their effectiveness. This technology involves enclosing one or more active principles within a protective matrix, creating a physical barrier that isolates them from their external environment. Encapsulation aims to protect these sensitive compounds, which are often fragile when exposed to oxygen, light, digestive pH, or enzymes. Thanks to adapted matrices, the active ingredients maintain their integrity from their incorporation until their release at the intended site of action (intestine, rumen, or other). This not only ensures better bioavailability but also prolonged and repeatable efficacy over time.

Beyond simple protection, encapsulation is also a tool for functional precision. It allows for controlled release (immediate, prolonged, or delayed), which can be adapted to the specific needs of the animal or technical constraints (mode of administration, solid or liquid formulation, stability in premix or complete feed). This level of mastery is the result of continuous research in galenic, coupled with rigorous in vitro trials conducted in collaboration with research institutes and field partners.

ADJUSTING KINETICS TO MAXIMIZE FUNCTIONAL EFFICACY

In line with its advanced galenic approach, Techna's Innovation department has dedicated several years to the comparative study of various encapsulation matrices, including cellulosic, lipid, and protein-based materials. The goal was to adapt the release mode of plant extracts to the specific physiological needs of the target animal species. This work has enabled us to design and validate, within our laboratory, three innovative release kinetic profiles based on differentiated encapsulation and process, optimized by rigorous in vitro trials:

CAPS-QR "Quick Release": This allows for immediate release in the upper digestive tract. Ideal for fast-acting extracts (immune or antioxidant stimulation), it relies on matrices that disintegrate rapidly at neutral or acidic pH.

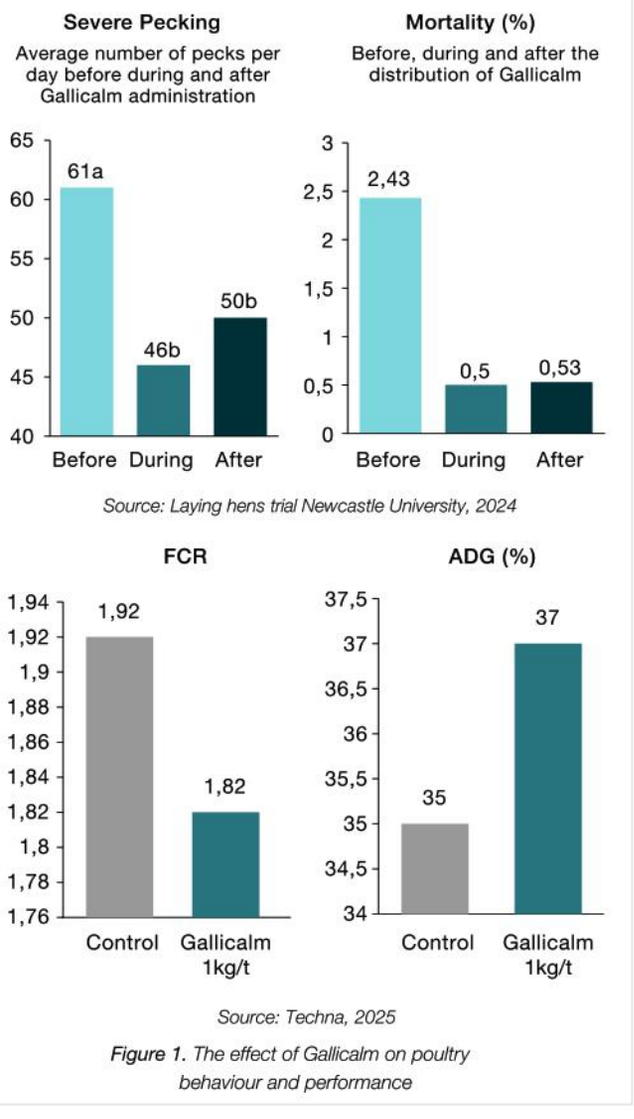
CAPS-SR "Slow Release": This ensures prolonged release throughout the entire digestive transit. Suited for active ingredients with sustained effects (natural anti-inflammatories, metabolic regulators), it uses coatings that modulate diffusion based on pH or enzymes.

CAPS-DR "Delayed Release": This targets specific areas of the lower digestive system, with delayed release allowing for local action (microbiota modulation, antimicrobial effect). It relies on coatings designed to resist the initial phases of digestion.

These differentiated galenic profiles offer flexibility in the use of plant extracts, allowing the release kinetics to be adapted to the biochemical nature of the active ingredient, the desired mode of action, and the animal's physiological context. This functional release design capability, coupled with fine control over manufacturing processes, constitutes a major technological advantage for the development of new-generation natural solutions for the different species (ruminant and monogastric).

APPLICATIONS IN POULTRY AND SWINE

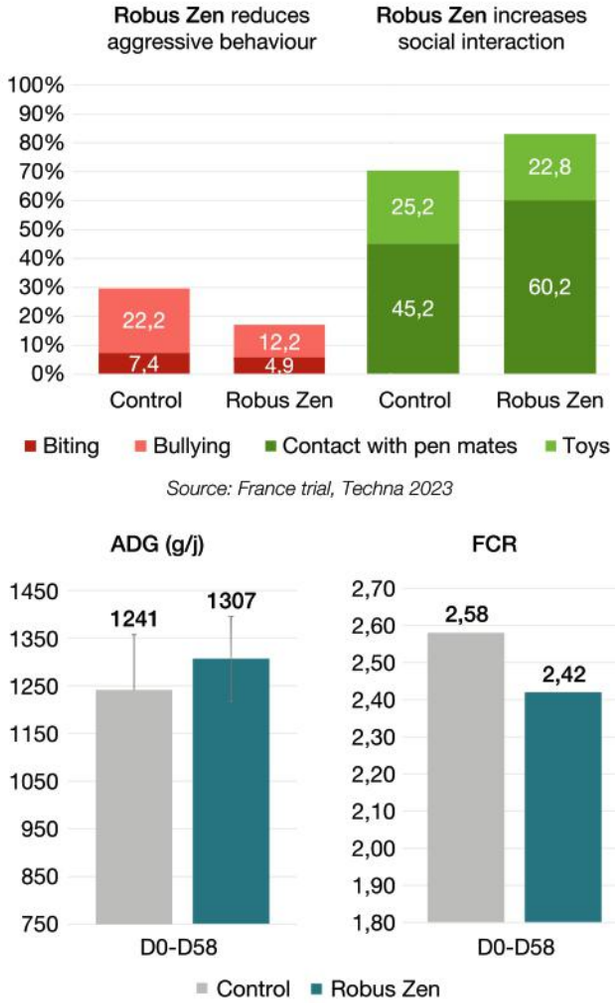
Gallicalm is a targeted phytogenic blend of aromatic substances and plant extracts, specifically formulated to control the negative effects of nervousness in poultry production. Its efficacy has been demonstrated in trials with laying hens, where it helped limit inappropriate behaviour such as feather pecking and scratching. Beyond behavioral improvements, Gallicalm also supports zootechnical performance (Figure 1).



Source: Laying hens trial Newcastle University, 2024

Source: Techna, 2025

Figure 1. *The effect of Gallicalm on poultry behaviour and performance*



Source: France trial, Techna 2023

Source: Poland trial, Techna 2025

Figure 2. *The effect of Robus Zen on pigs behaviour and performance*

Robus Zen is a specialized mixture of aromatic substances and plant extracts designed to limit the negative effects of nervousness in pigs, such as biting or bullying. By promoting calmer social interactions, Robus Zen also helps improve growth performance on swine farms (Figure 2).

Both products reflect Techna's scientific approach, leveraging botanical expertise, advanced formulation, and targeted delivery to support behavioral management in livestock.

Overall, phytogenic solutions have proven to be a natural and effective lever for addressing the multiple challenges of animal production. Beyond promoting animal welfare and reducing stress, their antioxidant, antimicrobial and digestive properties contribute also to improved feed efficiency, growth performance and overall herd and flock resilience. By acting on multiple physiological pathways, they serve as a valuable complement or alternative to conventional approaches, helping reduce antibiotics and synthetic inputs.

Backed by over 60 years of expertise in precision nutrition and natural health, Techna turns botanical science into practical solutions that support the livestock and feed industry in achieving optimal animal health, enhanced performance, and sustainable productivity.

About Jihane Guihard

As R&D Project Manager at Techna, Jihane Guihard holds an engineering degree in product design and brings over fifteen years of experience in developing nutritional solutions. She has built deep expertise in phytotherapy and aromatherapy, driving projects that enhance both product efficacy and zootechnical performance.

About Samira El Mafadi Jian

Currently working as the Product Development Officer at Techna, Samira El Mafadi Jian holds a PhD in Food Process Engineering and brings over twenty years of expertise in the microencapsulation of active compounds. She has developed unique know-how in protecting and enhancing sensitive ingredients.

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- खनिज और विटामिन से युक्त, बेहतर उत्पादकता और रोग प्रतिरोधक क्षमता के लिए।
- बेहतर दूध उत्पादन, वसा (फैट) और एस.एन.एफ के लिए।
- रुमन माइक्रोब द्वारा आर.डी.पी. (R.D.P) में सुधार।
- बेहतर स्वास्थ्य और बीसीएस में सुधार के लिए।
- बेहतर एवं सम्पूर्ण उत्पादक काल (लैक्टेशन पीरियड) हेतु पशुओं के लिए सर्वोत्तम आहार।
- मक्की के साइलेज के साथ खिलाने से अधिकतम लाभ।
- दूधारू पशुओं के शीघ्र गर्भधारण में सहायक।
- 1 किलो फीड प्रति 2.5 लीटर दूध उत्पादन के लिए।

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उत्पादन
अधिक दूध उत्पादन
अधिक फैट और एस.एन.एफ

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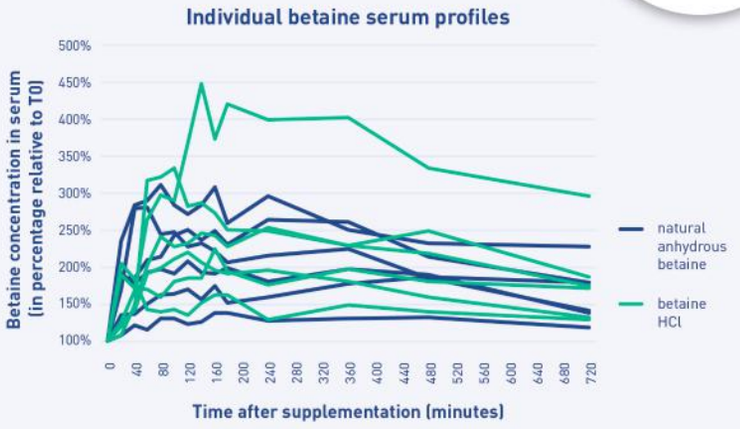

Individual profiles of the relative increase in the betaine level in the serum of pigs, after supplementation with betaine HCl (green lines) or natural anhydrous betaine (blue lines), show high variability.

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Alltech Launches Nutrition Service Capabilities in South Asia with new state-of-the-art laboratory in Pune

Alltech President and CEO Dr. Mark Lyons unveiled the **Alltech Nutrition Service Laboratory** at the company's Pune facility on Jan. 16, marking an important step in strengthening nutrition support across South Asia for Alltech. The event was attended by Alltech customers, farmers, partners, industry leaders and media and celebrated with music, dancers and floral decorations, reflecting the energy and optimism of the Alltech South Asia team.

The newly launched Nutrition Service Laboratory has been designed to support farmers at large and feed producers across the region at a time when South Asia is facing increasing protein demand alongside growing feed quality and safety challenges.

"As South Asia grows, so does the region's demand for premium animal protein. This is a massive opportunity for South Asian farmers, but it requires a new level of precision," said Dr. Mark Lyons, president and CEO of Alltech. "By launching this new laboratory in Pune, we are delivering real-time, actionable intelligence. Pairing our laboratory precision with our on-farm tools such as Alltech RAPIREAD™ and infrared thermography offers farmers a roadmap to superior animal health, stronger productivity and long-term sustainability."

The lab can test 50 feed and raw material parameters in Phase 1, with plans to nearly double this capacity in the next phases. These services are complemented by advanced on-farm tools such as Alltech® RAPIREAD™, infrared cameras, eggshell analysis tools and Draeger meters, ensuring producers and farmers receive practical, science-based support across the poultry, dairy and aqua sectors.

Highlighting the importance of the new laboratory, Dr. Aman Sayed, Alltech's managing director for India and regional director for South Asia, emphasized its role in translating science into practical outcomes.

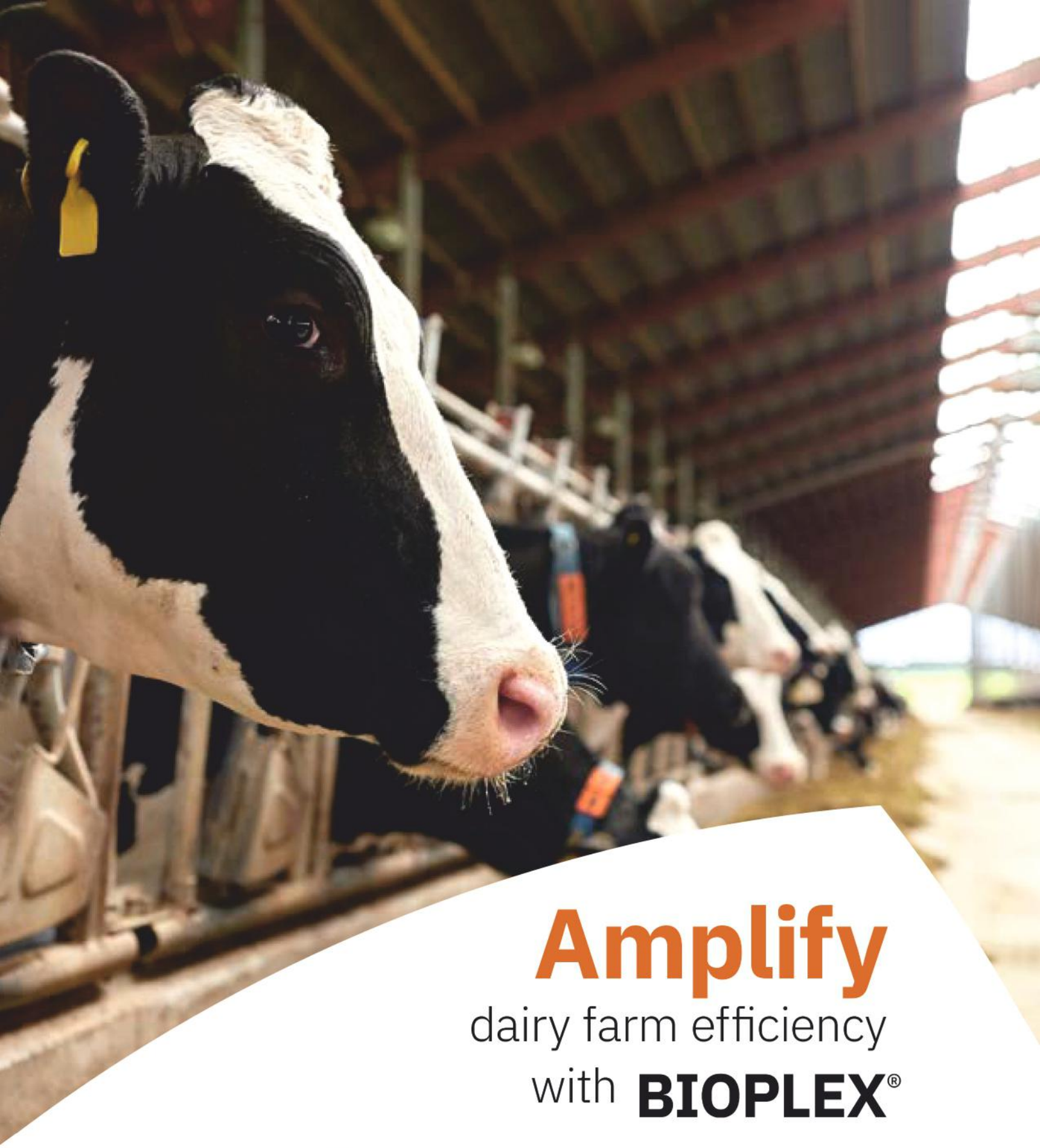
"The Nutrition Service Lab is not just a testing facility, it is a bridge between science and the farm," said Dr. Aman. "It helps the users to clearly understand what is happening in their feed and raw materials and allows us to guide them with practical, targeted nutritional solutions that deliver real value."

Alltech South Asia is also pleased to announce expanded production capabilities with a new bolus manufacturing unit featuring a capacity of 10,000 boluses per hour. Bringing this production in house will enhance efficiency, improve supply reliability and reduce environmental impact, all benefits that extend directly to neighboring markets.

The Pune facility also reflects Alltech's commitment to sustainability, with major investments in clean energy and environmentally responsible operations.

For more information, visit Alltech.com/India

Contact : **Ms Raksha PR** | rpr@alltech.com



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Hostazym® Dairy Ultra


HUVEPHARMA
B-Act® Dairy
Hostazym® Dairy Ultra


Monovet™ 200
(Monensin sodium)
How does Monovet™ 200 Works in reducing Methane emision


HUVEPHARMA
B-Act® Dairy
How B-ACT® DAIRY Works


HUVEPHARMA
B-Act® Dairy
Hostazym® Dairy


HUVEPHARMA
Hostazym® Dairy Ultra


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Nitromax
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Rumen Optimization


HUVEPHARMA


Monovet™ 200
HUVEPHARMA

Arm & Hammer Animal Nutrition

Appoints

Mr. Mijaj Khan
Sr. Account Manager - North India
(Poultry & Dairy Business)

Arm & Hammer Animal Nutrition is pleased to announce the appointment of Mr. Mijaj Khan as Senior Account Manager - North India (Poultry & Dairy Business), effective January 2, 2026. In this strategic role, Mijaj will spearhead key account management, customer engagement, and business expansion initiatives across North India, further strengthening the company's footprint in the Poultry and Dairy sectors.

Mijaj holds a Bachelor of Science degree and an MBA, combining strong scientific knowledge with strategic business leadership. With over 16 years of progressive experience in animal health and nutrition, he has built a distinguished career marked by consistent performance, market expansion, and long-term stakeholder partnerships.

Prior to joining Arm & Hammer, Mijaj has held key positions with leading organizations including Mankind Pharma, MSD Animal Health, Diamond V, and Elanco India Pvt. Ltd.. Across these assignments, he demonstrated strong expertise in strategic sales management, channel development, territory expansion, and key account leadership within competitive and high-growth markets.

Commenting on the appointment, Dr. Ajeet Bishnoi said:

"We are delighted to welcome Mijaj Khan to the Arm & Hammer leadership team. His extensive industry experience, customer-centric approach, and proven ability to drive sustainable growth align perfectly with our strategic objectives in North India. We are confident that his leadership will significantly enhance our Poultry and Dairy business operations."

On assuming his new responsibilities, Mijaj Khan stated:

"I am honored to join Arm & Hammer Animal Nutrition and look forward to contributing toward the company's growth journey. By strengthening customer partnerships and delivering science-backed nutritional solutions, we aim to create long-term value for the Poultry and Dairy industry in North India."

This appointment underscores Arm & Hammer Animal Nutrition's continued commitment to strengthening its leadership bench and accelerating growth through innovation, technical excellence, and customer-focused solutions in the livestock sector.

About Arm & Hammer Animal Nutrition:

Arm & Hammer Animal Nutrition, a division of Church & Dwight, is a global leader in science-based nutritional solutions for the livestock industry. The company specializes in feed additives, performance enhancers, and innovative technologies designed to improve animal health, productivity, and sustainability across poultry, dairy, and other livestock segments. With a strong focus on research, quality, and customer partnerships, Arm & Hammer Animal Nutrition delivers value-driven solutions to producers worldwide.

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