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Microchip Technology Improves Cattle Management

Nexa Labs developed an implantable microchip to enhance disease detection in cattle and streamline breeding management. Unlike traditional monitoring systems that rely on external devices limited to behavioral and movement observations, Nexa believes its technology offers a unique approach by directly collecting detailed physiological and biometric data from within the animal.

The tiny microchip is implanted just beneath the skin at the back of the ear. The USDA-compliant chip is paired with a small external ear tag, creating a system that tracks temperature, heart rate, breathing, blood oxygen, activity, GPS location and behavior. This broad-scale monitoring enables Nexa's analytics to flag the earliest signs of respiratory distress, udder inflammation, ketosis, lameness and other health issues, often before these symptoms become visible in the barn.

Beyond health monitoring, Nexa's technology brings precision to breeding management. The system automatically identifies cows in estrus and helps schedule breeding windows more accurately, optimizing artificial insemination and boosting pregnancy rates. These insights help farmers maximize herd productivity and reduce labor wasted on false positives, a common problem with collar-based systems that often misidentify heat signals.

Data collected by the microchip is transmitted via the ear tag to a central yard receiver, which uploads it to the cloud. Farmers access real-time insights through Nexa's web and mobile platforms. Company technicians and veterinary specialists handle system installation and provide ongoing monitoring support. The software provides full access to health and reproductive analytics, and users can leverage integrated AI Copilot features to analyze the data.

"The key differentiator is that other systems are all external and limited in what they can monitor, typically assessing only behavior and activity-related features like

lying, walking, and standing time," says Nexa co-founder and CEO Zarif Azher. "We monitor those as well, but because our microchip is under the skin, we can look at additional biometrics like body temperature, heart rate, and breathing rate; things you can't monitor from the outside because the animal's skin is thick and hair-covered. This increased accuracy helps reduce false positives and makes the system more reliable and worthwhile for modern cattle operations."

The chip is encased in a durable polymer and designed to last 8 to 10 years, typically covering the animal's lifetime.

"It's powered wirelessly by a small battery on the ear tag component, which is good for 5-plus years with no recharging necessary. This capability will satisfy most beef operations, with only an occasional swap once in a lifetime for a mother cow," Azher says.

The system also offers long-range connectivity for seamless operation across large herds.

Nexa Labs handles all design and development in California, including smaller production runs. Large-scale manufacturing is done in Seattle. Currently in pilot trials with California partners, Nexa is taking a measured approach to expansion, with plans for broader trials in the U.S. and internationally. Its aim is a commercial launch in the near future.

"We verify our accuracy and efficiency by testing and gathering data on farms," Azher says. "That's why we're rolling it out in a pilot fashion. Once we feel we're ready, we'll lay out the statistics, but we're encouraged by what we're seeing so far."

Farmers will receive the entire system, including hardware, software, and ongoing monitoring, for a flat monthly fee of about \$2 per cow, rather than complicated upfront and recurring costs.

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3-Pt. Hitch Cultivator Ideal For Small Farming

In a crowded market, Ignite Attachments has unveiled a new 62-in. wide, 3-pt. hitch cultivator for homeowners, hobby farmers and landscapers with compact tractors in the 25 to 40-hp range.

The cultivator features standard, adjustable, 1-in. replaceable tines, allowing users to tailor the tool to different soil conditions and tasks. For even more flexibility, 4-in. sweep spades are available as an option.

"Whether loosening compacted ground, blending in compost, or battling stubborn weeds, this 3-pt. hitch cultivator delivers consistent control and reliable results," says Ignite Sales Team member Bren McMillen.

The unit's sturdy frame, built from reinforced Grade 50 steel, delivers a lightweight yet exceptionally strong build, making it

easy to handle without sacrificing durability.

Ignite Attachments, a Bobcat-owned brand, takes pride in its tireless commitment to quality and continuous improvement.

"We buy our competitors' equipment, run them hard, and try to break them," McMillen explains. "We find their weak spots, then refine our designs with improvement in mind."

Manufactured using Bobcat's trusted supplier network and shipped fully assembled from Atlanta, the cultivator is priced at \$1,074.99, including free shipping.

"The market is saturated, but our pricing, free shipping, support, and the way we work with the most respected designers and engineers to test and improve our equipment help set us apart from our competitors," McMillen says.



Ferrock binder contains no Portland cement. Its main ingredient is ultra-fine steel particulates, which, thanks to their immense surface area, react quickly and thoroughly with water and carbon dioxide.

New Building Material Boosts Sustainable Construction

Ferrock, a remarkable new building material, was born from an accidental discovery. While trying to prevent steel particulates from clumping in water industry wells and trench filtration systems, inventor David Stone found that the process rapidly cemented the particles into a concrete-like substance. Rather than abandoning the unexpected result, Stone embraced it, developing a process that quickly bonded steel particles into an extremely hard material.

Simply put, Ferrock is made from waste. It consists of fine steel particles, dust, shavings, and small filaments, particularly from steel rather than pure iron.

"The secret lies in the rusting process," Stone says. "Rust buildup on a heavily corroded bolt and nut can act as an incredibly strong binder. Ferrock leverages this trait, allowing millions of tiny steel fragments to rust simultaneously and bind together, transforming corrosion from a destructive force into a constructive one."

The Ferrock binder contains no Portland cement. Its main ingredient is ultra-fine steel particulates, which, thanks to their immense surface area, react quickly and thoroughly with water and carbon dioxide. Ferrock is also carbon-negative, capturing CO₂ as the steel powder transforms into siderite crystals, iron carbonate minerals known for their earthy brown, yellow, and gray colors. About 10% of its weight is sequestered CO₂.

The process also uses a silica source, such as coal ash or ground glass, and incorporates a clay mixture and a mild organic acid to initiate the reaction. Under optimal conditions, warm temperatures, and abundant CO₂, Ferrock can set in just a few hours.

According to ScienceDirect, at 28 days, the material exceeds concrete by 13.5% in compressive strength, 20% in split tensile strength, and 18% in flexural strength.

Despite its promise, Ferrock has yet to break into the mainstream construction industry, which is often wary of change. Stone has instead pivoted to producing pre-made

structural panels strong enough to support a single story or a light roof. The product also outperforms traditional cement in high-heat and fire conditions, creating safer, more fire-resistant homes.

"We should be able to make a house that doesn't kill you if it catches on fire," Stone says. "Plus, building shapes and sizes is where we hope our niche happens. Typically, panels are 4 by 8, but since we're making them by hand, we can build unique sizes, put a curve in them, or bow them out to flex a little."

He describes his startup, Carbon-Bound (soon to be Ferrock Fabrication), as developing a new green material that aims to reduce carbon emissions, but it's premature to present it as a typical supplier.

Stone will not offer Ferrock as a raw material or advise people on how to make or use it. Instead, his company will build finished products, such as panels of various shapes, and sell them. Their cost will be comparable to that of competitive products already on the market.

"As Emil Hanson did over 100 years ago, when he had the idea to create a more durable concrete using clean local sand instead of dirt and clay, we're now starting over in a sense with the double challenge of making strong, durable structures as well as making them green and sustainable."

Stone is actively developing international contacts by building panel prototypes to attract the attention of major industry leaders. Some connections have already shown interest in using the material for specific projects.

"We must develop our prototypes into real products and demonstrate their use in the field," Stone says. "It's possible we could negotiate a partnership where another company would do the initial manufacturing."

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