

AgriIntelli

The Intelligent Management System For Dairy Farm

www.agriintelli.com



INTRODUCTION

AGRIINTELLI BUSINESS

Founded in 1978, the company has long been dedicated to the R&D and manufacturing of dairy milking equipment and ranch facilities. In 2020, the company established the AgriIntelli Division, integrating cutting-edge technologies such as video intelligence analysis, pattern recognition, machine vision, and IoT. The division is committed to delivering precision intelligent solutions for livestock farming, driving the industry toward IoT-enabled operational visibility, data-driven decision-making, and cognitive farming systems.



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AgriIntelli

Recognizing the digital transformation sweeping the livestock industry, we expanded our technological leadership into agriculture. The sector's evolution—driven by information systems, biotechnology, big data ecosystems, and AI-driven automation—demands next-generation solutions. Our approach redefines animal husbandry through three key innovations:

- IoT-enabled operational visibility for real-time farm monitoring
- Data-centric decision architectures for precision livestock management

- Cognitive farming systems integrating AI and machine learning

In 2020, we established the AgriIntelli Division, combining 15 years of R&D in pattern recognition and machine vision to deliver precision-engineered solutions for modern livestock operations. By merging security-grade AI with agricultural expertise, we empower farms with smarter, data-driven, and sustainable management tools.

OVERVIEW

The low-carbon path of the dairy industry may be a must go path. As mentioned in Article 5 of the Regulations on Carbon Emissions trading, in the future, the category and industry scope of greenhouse gases covered by the national carbon Emissions trading will be proposed in accordance with the national greenhouse gas emission control targets. There is a considerable possibility that the dairy industry will be included in it. According to a report released by the World Resource Institute in 2020, agriculture accounts for 18.4% of global carbon emissions, with livestock production and manure emissions accounting for 31.5% of agricultural emissions, accounting for 5.8% of total emissions.

Ruminants, due to their rumen fermentation, produce more greenhouse gases than single stomach animals such as pigs and chickens. The data shows that a high-yielding cow's annual greenhouse gas emissions are equivalent to the emissions of a small car. At the same time, the fecal discharge of cows is also an important source of water pollution.

In recent years, the animal husbandry industry has achieved rapid development relying on scientific and technological innovation and change. High technolo-

gies such as information technology, biotechnology, Big data, Internet technology and artificial intelligence have promoted the integration of animal husbandry industry, and also promoted the development of animal husbandry to informatization, digitalization and intelligence. The goal of "low-carbon emission reduction" in the animal husbandry industry is a systematic, long-term and complex work, which requires the government, scientific research institutions Enterprises are working together to crack the problem.



"The Intelligent Farm — Comfortable, Sustainable, and Safe"

By utilizing the "IoT (Internet of Things) + Big Data + AI (Artificial Intelligence) + Edge Computing" technologies and combining them with the environmental conditions of the ranch, we can comprehensively manage the ranch in a more timely, accurate, and intelligent manner through the Smart Ranch Cloud Platform (CloudPlatform), targeted spraying, intelligent environmental control (Intelligent ENV), smart electricity and energy management, and automatic feed pushers.

The system intelligently regulates and controls the operation of lighting, roller shutter systems (Curtain System), fans, spraying systems, manure scraping, automatic feed pushers, and other equipment in the ranch. This ensures the safety, sustainability, and dynamic equilibrium of the ranch environment while providing a comfortable living environment for the cows.



CONSTRUCTION

The system enables real-time data recording across all production stages. Through intelligent data modeling analysis, it achieves online monitoring of the complete aquaculture lifecycle. Upon anomaly detection, the system immediately issues alerts, allowing operators to promptly identify issues and verify corrective actions - effectively preventing significant economic losses. Furthermore, all operational data remains accessible via the Big Data platform, facilitating remote supervision and significantly enhancing overall farm management efficiency.



VALUE

Compared with conventional technologies, the system significantly enhances operational efficiency and reduces costs, achieving over 60% water savings, more than 30% wastewater reduction, and over 30% electricity conservation. The feed-pushing robot ensures high-frequency delivery to stimulate cow feeding, increasing dry matter intake by 2–3% and milk yield by 3–5%, while lowering feed residue rate from 5–8% to just 2–3%.



Power Saving

- Achieves 30% reduction in both electricity consumption and carbon emissions through intelligent power management
- Implements automated fault detection and resolution, extending equipment lifespan by 20%
- Reduces maintenance workforce requirements by 2-5 full-time technicians through predictive diagnostics



Water Saving

- Real-time equipment monitoring for precision maintenance
- >99.99% cattle recognition accuracy
- <0.01% false spray rate
- AI-powered object detection (humans/vehicles/birds) with customizable reporting
- Remote parameter adjustment via mobile app + water usage analytics



Labor Saving

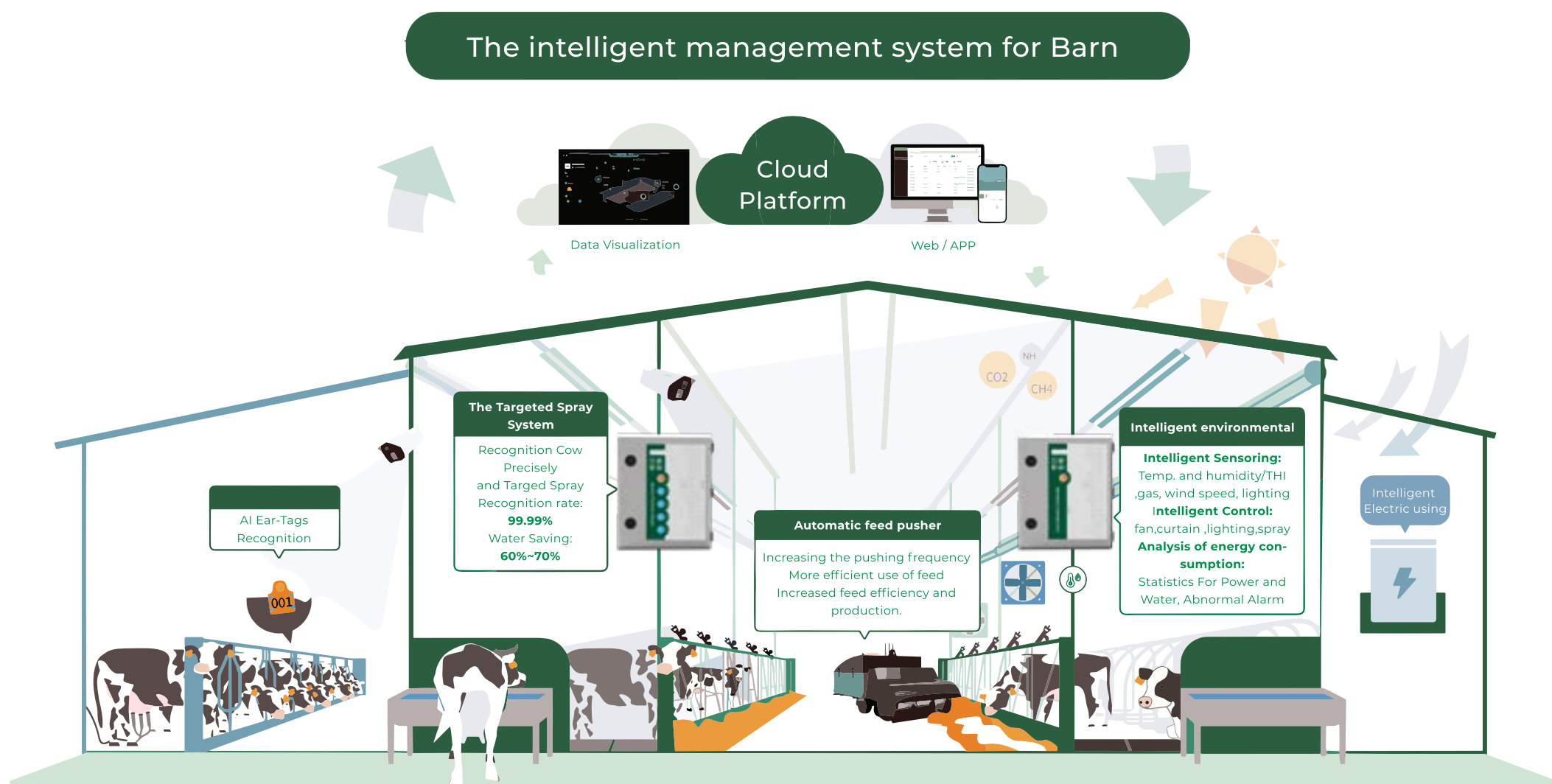
The management platform enables automated control of ranch equipment - including lighting, roller curtains, fans, spray systems, manure scrapers, and feed-pushing robots - by allowing customizable environmental thresholds, significantly reducing manual intervention.

Centralized Networked Monitoring via a Single Platform **Livestock360**

The intelligent cattle barn management system, built on a cloud platform architecture, integrates decentralized equipment (sprayers, fans, water troughs, manure scrapers, roller curtains, surveillance devices, etc.) through multiple communication protocols including serial data interfaces, Ethernet, MBus, LoRa, and 4G/5G networks. This creates a unified monitoring platform that enables:

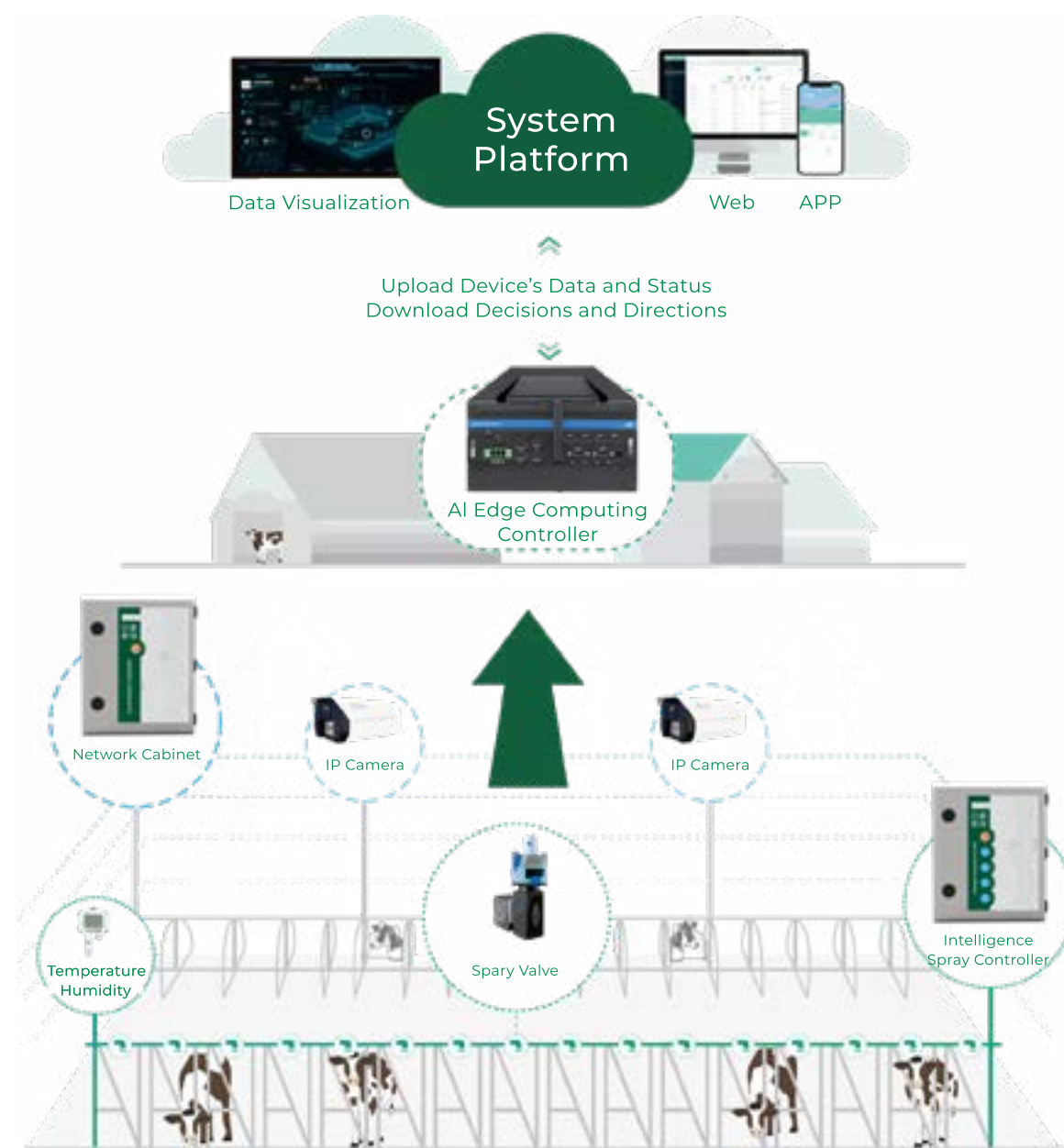
- Comprehensive tracking of water/electricity usage, environmental parameters, equipment status, and herd conditions
- Data convergence on a shared big data platform for interconnected information flow
- Closed-loop management across all operational systems

The system utilizes AI-powered precise cattle identification and real-time environmental sensing within the barn, achieving over 98% recognition accuracy to locate individual cows. It intelligently activates corresponding spray nozzles based on bovine positioning while synchronizing ventilation fans, roller curtains, and other systems. This integrated approach enables centralized, coordinated control of all environmental management equipment across the ranch - significantly reducing energy consumption and operational costs.





SmartSpray™ AI



99.99%
Recognition Rate

60-70%
Water-Saving

SmartSpray™

The AI Vision Inspection-based Targeted Spray System adopts a “cloud-edge-end” system architecture, integrating real-time temperature, humidity, and THI (Temperature-Humidity Index) data from the cowshed.

Using intelligent video analysis technology, it identifies and locates the precise position of each cow, enabling accurate control of the solenoid valves' activation and deactivation timing. This achieves the “spray when cows arrive, stop when cows leave” effect.

Compared to traditional radar and infrared sensors—which cannot distinguish between humans, cows, and vehicles, often leading to false activations—this vision-based precision spray system offers more timely, sensitive, and intelligent spray control. As a result, it significantly improves water resource utilization efficiency.



Real-time monitoring of pipeline water pressure and pump operation status.

The system monitors water pressure in spray pipelines and pump operation status in real time. Upon detecting abnormalities, it immediately alerts management personnel via APP notifications, SMS, or voice calls. Managers can remotely activate/deactivate pumps and valves via the application system, effectively preventing pipeline bursts caused by residual water in winter.

Product Advantages

Precision Recognition & Targeted Spray Control

Accurate Cow Detection & Localization

System intelligently identifies individual cows and activates the nearest solenoid valve for spray control.

Real-Time Monitoring & Analysis

Combines camera vision and environmental sensors to enable point-to-point precise spraying via smart spray controllers.

Industry-Leading Accuracy

Achieves 99.99% recognition precision in cattle identification.



Intelligent Inspection with Continuous Algorithm Optimization

Advanced Recognition for Uninterrupted Precision Dynamic Algorithm Updates

Continuously refined algorithms ensure adaptive learning for evolving conditions.

Robust Object Discrimination

Accurately distinguishes targets from irrelevant movements:

- Pipeline water flow
- Fan rotation
- Stationary cows

Precision Spray Control

Delivers more accurate and effective spray activation/deactivation.



Data-Driven Intelligence: Statistics, Analysis & Deep Learning

AI-Optimized Spray Control Through Advanced Analytics Continuous Learning System

- Performs long-term statistical analysis of barn conditions
- Applies big data analytics, deep learning, and reinforcement algorithms to refine operations

Environment Optimization

- Derives ideal environmental parameters for cattle barns from historical data
- Automatically adjusts:
 - Spray activation thresholds
 - Water volume parameters
 - Environmental balance targets

Dynamic Adaptation

- Maintains optimal barn conditions through real-time system adjustments
- Continuously improves performance via machine learning feedback loops

Dynamic Perception & Automatic Regulation

Maintaining Optimal Barn Environment Through Intelligent Control

Temperature Regulation

High Temperature Scenario: When the barn temperature exceeds the threshold, the system activates traditional spray mode to rapidly and effectively cool the environment.

Humidity Control

High Humidity Scenario: If humidity levels rise above the set value, the system automatically stops spraying until humidity normalizes, then resumes point-to-point precision spray.

Cow Movement Adaptation

-Multi-Zone Coverage: When cows straddle multiple areas, the system intelligently activates all spray units across the affected zones.

-Adjacent Zone Linkage: Optionally, spray units in adjacent areas can be synchronized for enhanced coverage based on cow location.





ECS
(Environment
Control System)

ECS (Environment Control System)

The Environmental Control System (ECS), through monitoring equipment installed in the cowshed, detects, collects, and records key environmental parameters, including temperature, humidity, harmful gas concentrations (ammonia, hydrogen sulfide, methane), light intensity, and wind speed. It intelligently controls equipment such as fans and light-

ing to maintain dynamic equilibrium in the cowshed's internal environment, ensuring a comfortable living space for cows.

Staff can log in to the system platform via web browsers or mobile apps to monitor real-time environmental data and remotely adjust fans, lighting, wet curtains, and other devices. This enables

scientific and efficient environmental management, ultimately reducing operational costs, improving herd health, and increasing milk production.

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Application Scenarios

The ECS, through the environmental monitoring equipment installed in the cowshed, detects, collects, and records the temperature, humidity, harmful gas concentrations (ammonia, hydrogen sulfide, methane, and other gases), light intensity, and wind speed within the internal environment of the cowshed.

EMCS(Energy Management of Control System)

Automatically control the fan speed regulation, the system will computing the suitable fan speed with the cowshed's environment (about temperature, gas, wind speed etc).

Reduce Power Emissions over 20%.

Automatically Turn Off Fans and Lights when the Cows Leaving

By AI vision inspection technology, when the cowshed have no cows, the system turn off the fans, lights.



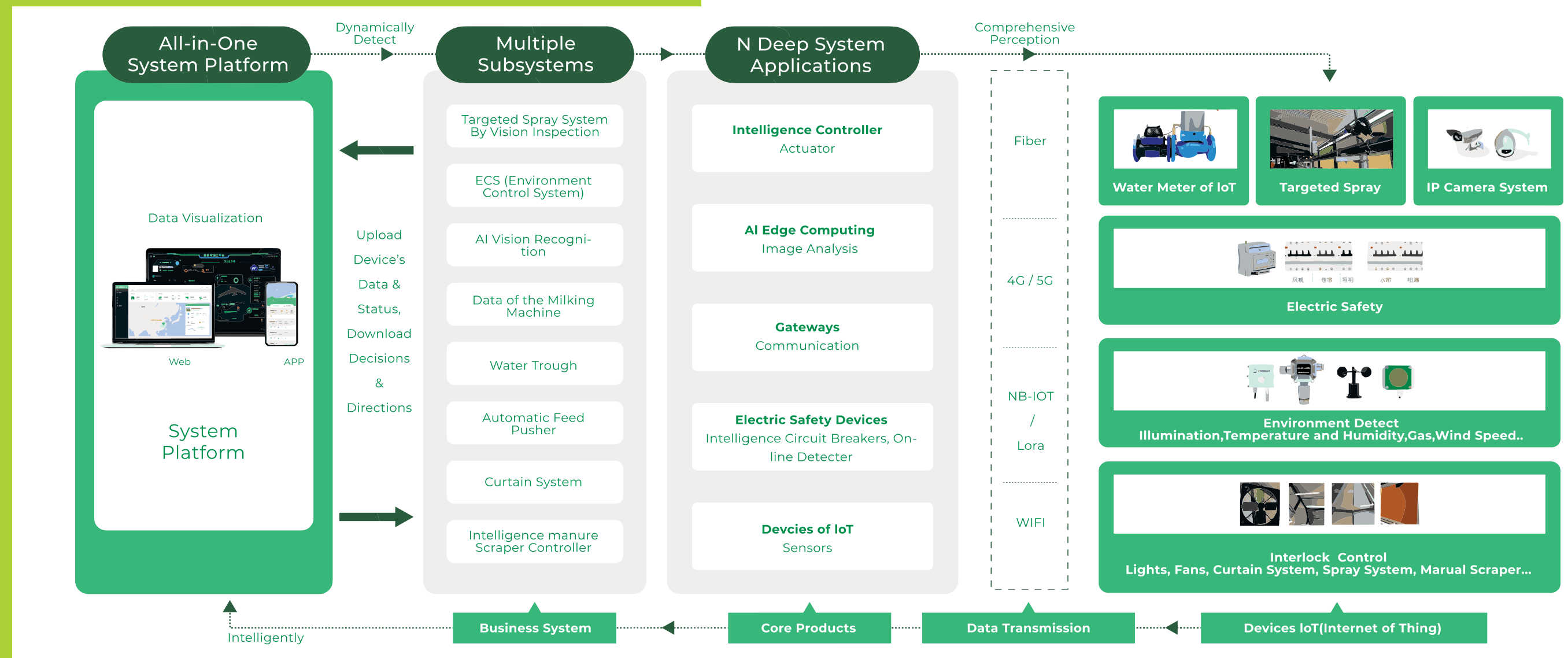
Online Turn Off Fans and Lights

Easy configuration how many fans or what time keep working with the temperature and humidity, toxic gas.

Easy configuration lights turning on or off with the illumination.

Electric Safety, Online Monitoring

Realtime detect the current, voltage, phase, temperature, when the overcurrent, over/under voltage, defective phase, over temperature is detected, the system will turn-off the circuit and alarm.



Centralized Networked Monitoring via a Single Platform

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TARA-MAG

FEED PUSHER ROBOT



Typically, the farm requires hourly feed pushing. However, manual operations often face delays or omissions due to conflicting tasks, resulting in untimely access to fresh feed for cows and ineffective control of feed residue.

The TARA-MAG Automatic Feed Pusher is specifically engineered for farm feed pushing operations. It delivers:

- Fully automated operation with precise scheduling
- Proven efficiency in maintaining feed freshness
- Dual benefits of
 - 5-8% reduction in feed waste
 - 3-5% increase in milk yield

This automated solution significantly enhances the farm's intelligent management capabilities.

The AI vision system performs real-time identification of residual feed (detection accuracy: 98.7%), automatically notifying managers regarding:

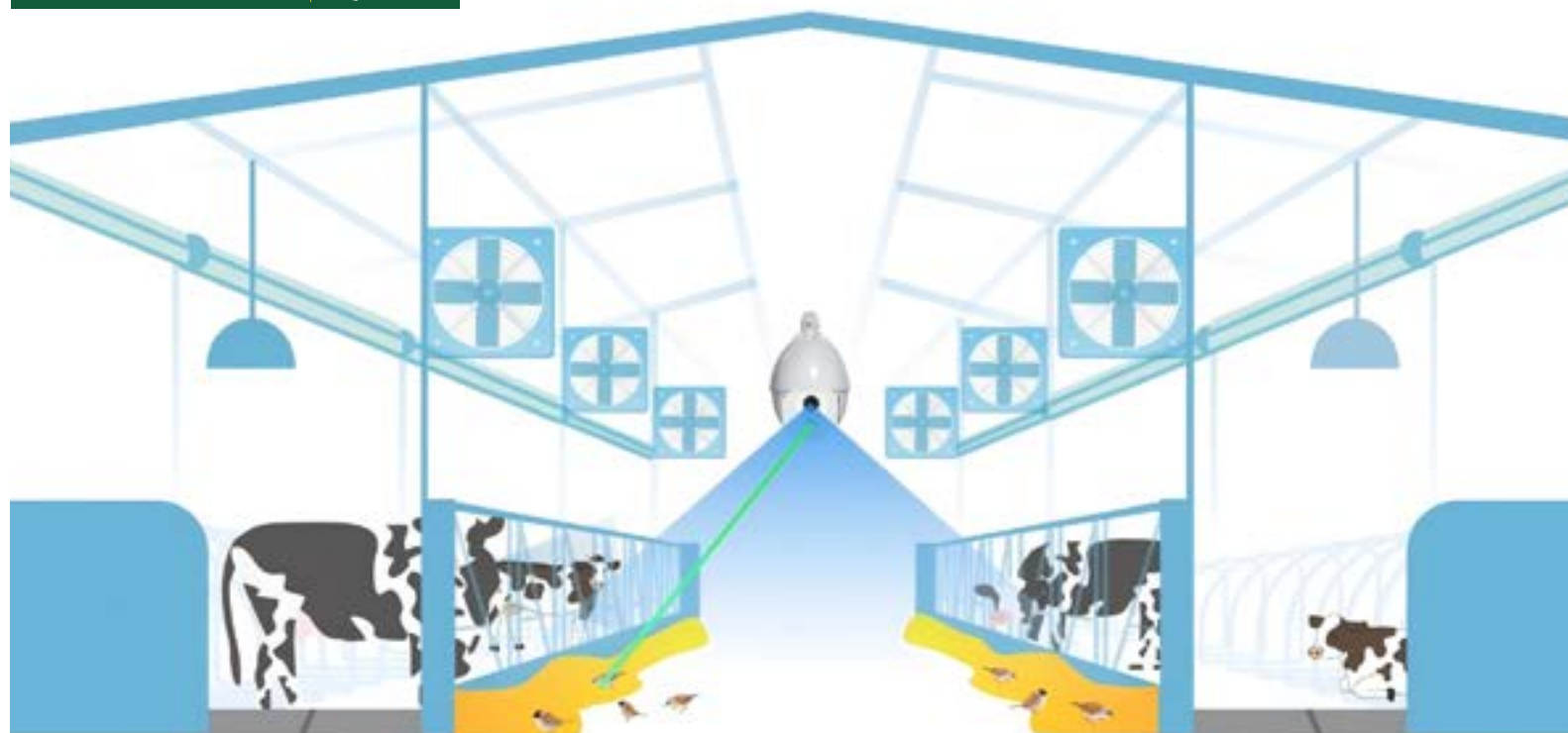
-Optimal Feeding Times - Based on feed bunk scoring (0-4 scale)

-Push Scheduling - When TMR reaches 30% displacement threshold



AI BIRD DETERRENT

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Product Introduction

Using AI video analytics technology, the system detects and identifies birds stealing feed in cattle feeding alleys in real time. Through tracking and targeting technology, it rapidly emits laser beams near the birds' locations. The laser creates bright spots in front of the birds' eyes, disrupting their visual system and causing discomfort or fear, thereby driving them away.

This effectively solves key challenges on dairy farms:

- Excessive feed loss due to bird theft
- Risk of cattle infection from bird-borne pathogens
- Short-lived effectiveness of traditional bird-scaring methods

Value

Birds preferentially consume the high-protein, high-nutrition components in Total Mixed Ration (TMR). When birds extensively feed on these valuable portions, dairy cattle are deprived of essential nutrients, resulting in decreased milk production and reduced farm profitability.

Moreover, birds act as carriers for numerous pathogens. Through their droppings, they can transmit these disease-causing agents to livestock. Once these pathogens contaminate animal feed and water sources, they may trigger disease outbreaks among the cattle population.

Nesting on Farm Structures Causes Physical Damage and Operational Disruptions



ROTARY MILK- ING SYSTEM

The AgriIntelli 80-stall heavy-duty rotary Milking system features a modular design with a fully sealed baseplate. The chassis is primarily constructed from 304 stainless steel and hot-dip galvanized steel, complemented by a high-strength fiber concrete tabletop. It incorporates a heavy-duty dual-track structure and carbon fiber composite rollers, along with a 6+2 drive module. Equipped with comprehensive safety protection devices, it ensures safe and stable 24/7 operation year-round with low failure rates and operational costs.



More robust chassis design

The milking parlor platform features a fully enclosed structure, with main components constructed from 304 stainless steel and hot-dip galvanized steel. The deck utilizes high-strength fiber-reinforced concrete, while the standing areas are equipped with 24mm thick rubber mats. Each stall includes an all-stainless-steel control cabinet and partition rail.

The platform is designed with an inward-sloping profile (lower center/higher periphery) incorporating a circular drainage channel for efficient wastewater collection and discharge.



No-Downtime Main- tenance & Anti-Creep Performance

The drive system adopts frequency-conversion electric drive with multiple motor sets and an online backup drive system, ensuring continuous rotary operation even if 1-2 motors fail. The number of motor inverters matches the quantity of motors, providing simultaneous backup for both motors and inverters.

The drive wheels and transmission wheels are constructed from wear-resistant materials, delivering smooth rotation without creeping effects. The rotational speed is adjustable (5-18 minutes per revolution).

The outer-mounted drive system enables rapid maintenance without stopping operation, achieving true 24/7 uninterrupted performance.

Smart Milking Parlor Health Monitoring

This rotary platform control system features health management with:

Fully digital control – No relays or contactors, direct system integration

Smart sensors – Real-time fault alerts and predictive maintenance

24/7 monitoring – Early warnings and mobile alerts

Auto work orders – Instant troubleshooting guides sent to technicians

Powered By
Schneider
Electric



About Design



Smooth-Flush Manufacturing Technology

The rotary disc adopts the non-convex manufacturing process, and all the fixed parts of the body facade are tenon and suction type sinking structure, so as to protect the cow body and the hoof from the injury.

Fully Enclosed Chassis Design

The modular and splice-type fully enclosed chassis design is engineered to enhance on-site installation efficiency and waterproof performance. The chassis is assembled on-site using a building block-style bolted connection, eliminating the need for welding. This ensures that the turntable operates without issues such as water leakage from the chassis.

2 : 1

2 : 1 large ratio between milking point and wheels (80 milking point with 120 driving wheels). And the roller diameter is 180mm.

AgriIntelli
INTELLIGENCE IN LIVESTOCK

Quick-Release Roller Mechanism

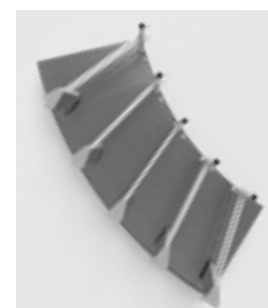
The removable roller mechanism is the original design of AgriIntelli. The lower orbit has a quick unloading device. If you need to replace the roller, you can remove the fast track and replace the roller.

Dual-Screen Touch Control System

The lower section features physical buttons for turntable motion control, while the upper section integrates an embedded tablet running the Rotary Parlor Control Terminal for real-time management of both cattle and platform operations.

Schneider Electric TeSys Island Intelligent Control System

Since 2023, the AgriIntelli Rotary has been upgraded to Schneider TeSys Island full digital control system, and the operation data is transmitted to the cloud in real time, which can achieve predictive maintenance.



The stall is tilted at a 13-degree angle relative to the horizontal plane. This design facilitates cattle entry and exit while effectively preventing pinching.

The pentagonal-shaped stall body is simultaneously tilted forward by 10° and bent with radius-forming tooling, significantly increasing manufacturing complexity. However, this design enhances entry space and operational convenience for the 13° angled cow stalls, adding at least 2 seconds of entry time at a rotation speed of 7 minutes per revolution. The smooth, radius-formed structure eliminates sharp edges, maximizing cattle protection.

The dual-track central roller system is the standard configuration for heavy-duty rotary platforms. Its guiding precision, operational stability, and durability all surpass those of single-track structures.

The externally mounted drive modules employ an external friction drive mechanism to power the rotary platform. This design enables maintenance of the power system without stopping operation, allowing the rotary system to achieve true 24/7 uninterrupted operation. The fully enclosed drive system ensures safer and more reliable performance.

The rodless magnetic rail cylinder is a precision industrial product. With no wearable components or extending rods, it outperforms traditional cylinders in durability while delivering gentler cup detachment movements.

SMART ROLLER CURTAIN

Barn Curtain System intelligently adjusts opening/closing degrees to achieve precise environmental control, integrating ventilation, insulation, and heat prevention functions while automatically optimizing lighting conditions based on sunlight intensity to enhance cow comfort and milk production. The system features an emergency response mechanism that automatically closes during storms to ensure livestock safety. Constructed with high-strength weather-resistant PE material, its standout advantages include over 30% reduction in mechanical ventilation energy consumption and seamless smart integration with temperature-humidity sensors and farm management systems, delivering an energy-efficient modernized environmental control solution for cattle barns.

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Core Technological Components

IoT-Enabled Automation

- Integrated sensors (temperature/humidity/ammonia/wind speed) with $\pm 0.5\%$ accuracy
- Smart-controlled servo motors (0-100% opening precision in 15-second response time)

Adaptive Control Algorithms

- Machine learning models analyzing 20+ environmental parameters
- Predictive adjustment based on weather forecasts (3-hour preemptive response)

Operational Benefits

Energy Efficiency

- Reduce ventilation energy costs by 30-45% through optimized opening schedules
- Maintain ideal THI (Temperature-Humidity Index) within 68-72 range

Animal Welfare

- Dynamic airflow adjustment prevents heat stress (reduce respiratory rate by 8-12 bpm)
- UV-blocking fabrics (85% protection) with programmable daylight simulation

Data Integration

- Real-time synchronization with farm management software (e.g., AfiFarm, DelPro)
- Historical trend analysis for regulatory compliance reporting

Advanced Features

Emergency Protocols

- Automatic closure during rain/storms (45dB sound detection triggers full closure in <60s)
- Backup power system (72-hour operation capability)

Customizable Zones

- Independent control for calf/transition/milking areas
- Differential opening strategies (top/bottom ventilation modes)

Maintenance AI

- Predictive wear alerts for motor components (500,000 cycle lifespan monitoring)
- Self-diagnosis of track obstructions (laser alignment verification)

AgriIntelli



Parallel Milking Parlor

PROFESSIONAL FARM EQUIPMENT

The smart farming system integrates all ranch equipment through IoT and AI technologies to achieve precision livestock management. These technologies work in synergy to reduce labor costs while improving production efficiency, optimizing overall operations through data-driven decision-making. Featuring a modular design, the system can be flexibly configured for ranches of varying scales, ensuring stable and reliable operation.



Manure Scraper



Cow Pusher



Intelligent Water Trough



Rotary Platform Washing System



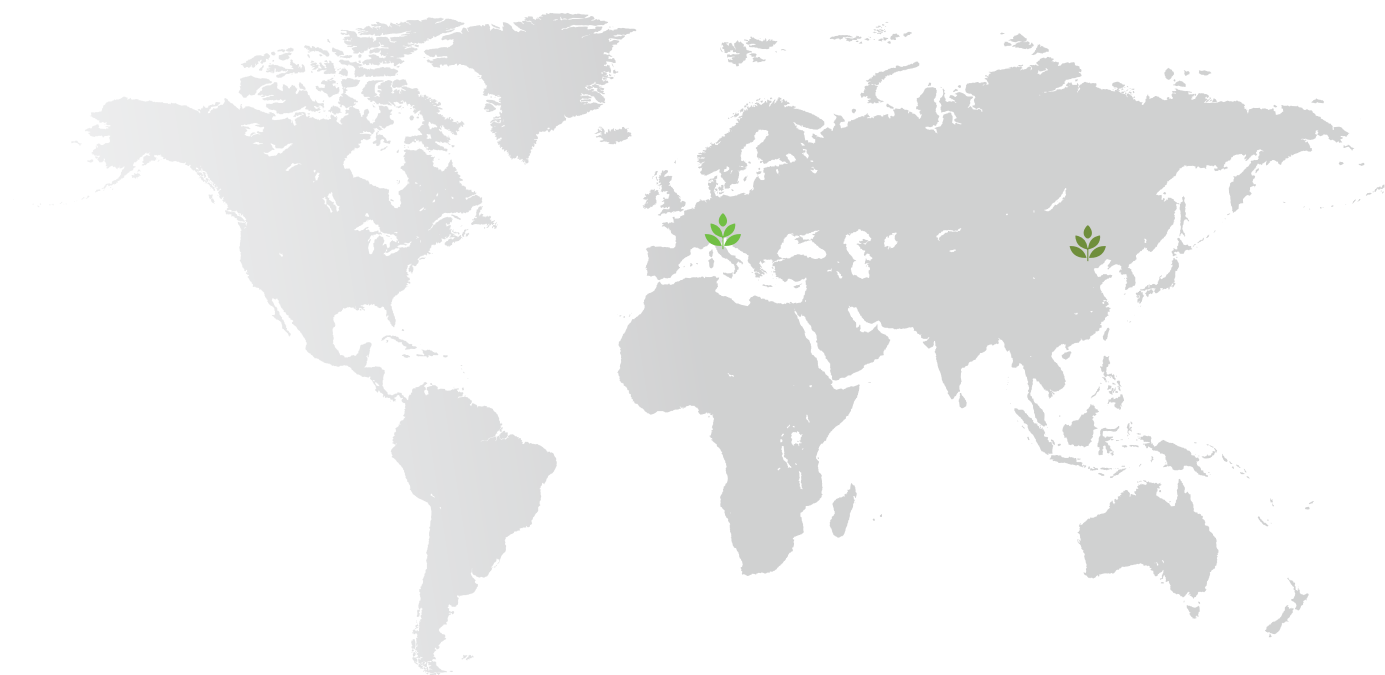
Cattle Brush



Headlock & Free Stall



Agri Fan



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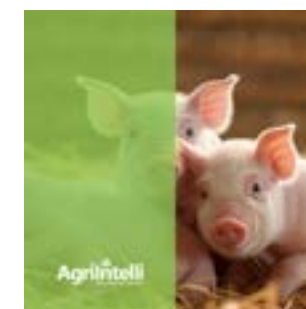
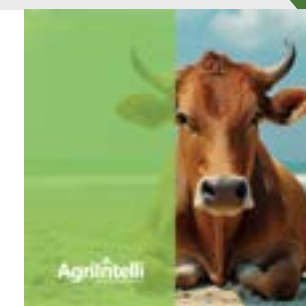
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Carbon-Conscious Herding

AgriIntelli Powers Sustainable Livestock Solutions.



