

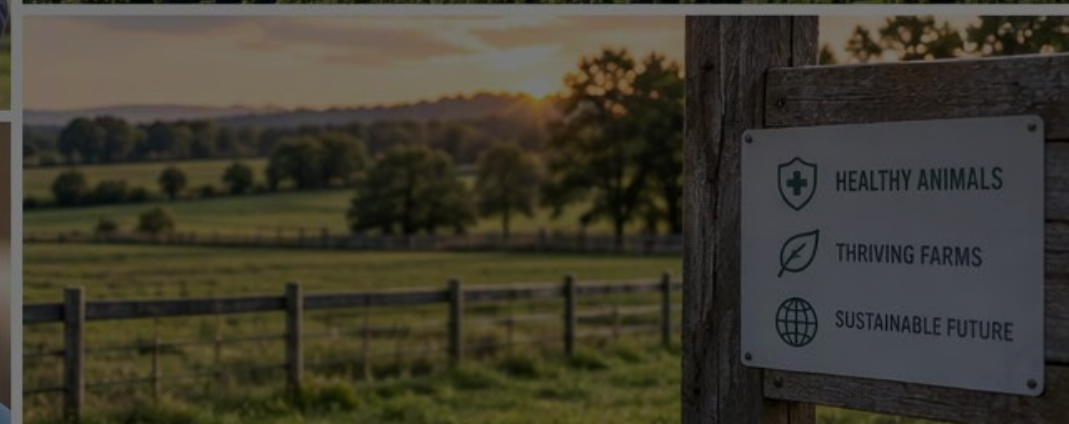
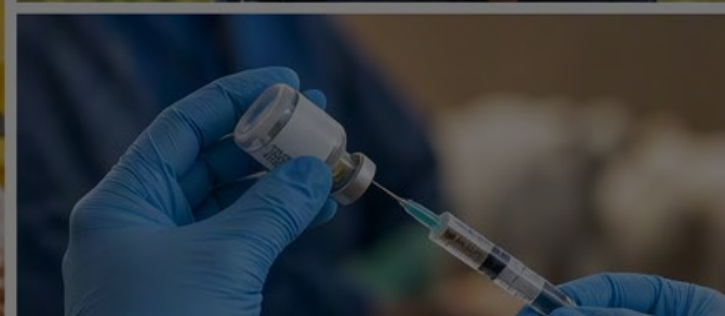


What does the animal health toolbox have to offer?

How prevention, diagnostics, data and precision technologies have evolved over the past decade



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How animal health became a two-engine industry

Pet health has become a notable growth engine but livestock health remains essential to food security and protein production

Pet health rose in strategic prominence over last decade

Pets will represent around 60% of European animal health market by 2030 (compared to about 50% in 2020)

SC Group

Pet spending has expanded as owners seek increasingly sophisticated preventive care, diagnostics and therapeutics. The livestock health sector has grown at a slower pace in the last five years. However, this has changed in 2026 so far, due to heightened disease threats and macroeconomic pressure on pet owner spending.

Companion animal growth

Higher spend per animal, chronic disease management, premium therapeutics and diagnostics, and consumer willingness to pay create attractive recurring growth.

Food animal resilience

Large livestock populations, growing protein demand and the economic cost of disease sustain demand for vaccines, therapeutics and productivity tools.

Successful portfolios

Diversified across species and geographies, strong prevention franchises, innovation pipelines, recurring products, increasing diagnostic and data capabilities.

The strategic balance

Companion animals can lift growth and margins, while food animal franchises add scale, resilience, biosecurity relevance and exposure to global protein demand.

The toolbox has widened but prevention remains the foundation

The biggest change since the mid-2010s is the addition of earlier/more precise layers of technologies

PREVENT

Vaccines & biosecurity

Stop disease or reduce severity

DETECT

Diagnostics & surveillance

Identify pathogens and risk sooner

MONITOR

Sensors, cameras & wearables

Continuous animal and group-level signals

DECIDE

AI, analytics & herd software

Convert signals into actionable alerts

TARGET

Precision treatment & automation

Intervene where and when needed

SELECT

Genomics & breeding

Build resilience and efficiency upstream

TRACE

Digital ID & traceability

Link health events across the chain

RESPOND

Therapeutics remain important

Treat disease when prevention is not enough

The expanding toolbox has seen the breadth of innovators widen to include smaller businesses and start-ups

A decade of change: from episodic treatment to continuous prevention

2016-2026: More of the toolbox now acts before clinical disease is obvious

~2016

Treat & vaccinate

Routine vaccines,
therapeutics, lab
diagnostics

*Decisions often
triggered by visible
disease*

~2020

Connect & measure

Wearables, electronic
ID, cloud herd systems

*More continuous
behavioural and
production data*

~2023

Predict & automate

Computer vision,
algorithms,
environmental
surveillance

*Earlier alerts and
group-level monitoring*

2026

Integrate & verify

Genomics + diagnostics
+ monitoring + decision
support

*Toolboxes increasingly
combine intervention
with data*

Vaccines: Established tool with expanding technology base

Prevention has gained strategic weight as the industry seeks healthier animals with less reliance on antimicrobial treatment



- Established platforms still dominate – live attenuated and inactivated vaccines remain major technologies.
- Recombinant and vectored approaches have broadened vaccine design options over the decade.
- RNA-based platforms are emerging in veterinary medicine, while still a small part of the overall vaccine toolbox.
- Policy is increasingly linking vaccination strategies with antimicrobial stewardship.

**Prevention → fewer infections → fewer treatments
→ better productivity and welfare**

Vaccine uptake: Meaningful growth but coverage is disease- and sector-specific

There is no single global vaccination rate

UK cattle example

+30%

Cattle vaccine doses sold annually, 2011-2025

Agriculture and Horticulture Development Board

+105%

Estimated uptake increase for calf enteritis vaccination, 2011-2025

Agriculture and Horticulture Development Board

What the numbers tell us

- Vaccination has expanded in mature livestock markets but uptake varies widely by pathogen, production system and economics.
- Dose-sales data are a proxy, not a direct measure of animals protected. Multi-dose regimes, imports and supply shortages complicate comparisons.
- Adoption is strongest when disease risk is visible and the return from avoided mortality, morbidity or treatment is clear.

Precision livestock technology changes the unit of observation

The industry has moved from occasional visual checks toward continuous animal- and group-level data



- Wearables can track activity, feeding, rumination and reproductive behaviour.
- Cameras and computer vision add contact-free observation at animal, pen and flock level.
- Algorithms can flag deviations before signs are obvious to a person during routine checks.
- The commercial value is not more data but earlier intervention, labour efficiency and more targeted decisions.

Adoption is growing – especially in dairy – but integration remains uneven because systems, standards and data access are fragmented.

Technology uptake: Sensors are moving into the mainstream in dairy

Adoption is rising but it remains uneven by technology, herd size and production system



18%

EU farms using
precision farming
technology or
practices in 2023

13%

Dairy farms in Ireland
using individual cow
activity sensors,
according to a 2018
survey

2018-2024

The Irish study
suggested adoption of
smart dairy tech has
increased across a
range of technologies

What is driving adoption?

- Labour pressure and larger herds increase the value of continuous monitoring and automation.
- Wearables are among the most established monitoring tools; camera-based systems are developing rapidly from a lower base.
- Economics still decides uptake – purchase cost is a leading barrier, while users prioritise return on investment.
- Survey figures are limited and do not provide an EU penetration rate – adoption differs substantially by geography, herd size and technology.

Dairy shows monitoring technology moving from niche tools toward a multi-technology management stack.

Why good tools still fail to achieve adoption

Vaccines and monitoring tech face different technical barriers

VACCINE ADOPTION CAN STALL

- Disease risk feels remote or inconsistent
- Cost is immediate; avoided losses are harder to see
- Multi-dose schedules, handling and labour add friction
- Veterinary recommendation and farmer confidence matter
- Supply shortages and manufacturing constraints disrupt routines
- Not every disease has a sufficiently effective or convenient vaccine

MONITORING/SENSOR ADOPTION CAN STALL

- Hardware + subscription cost can outrun perceived ROI
- Alerts without a clear action create data fatigue
- Connectivity, interoperability and legacy systems add friction
- False alerts undermine trust
- Training and digital literacy affect use after installation
- Value scales differently by herd size and production system

Adoption succeeds when a tool is useful, practical and economically visible. Evidence alone is rarely enough.

Diagnostics and surveillance are moving closer to the herd

The goal is increasingly to find disease earlier, sample more representatively and shorten time to action



- Molecular diagnostics have become faster and more sensitive, supporting earlier pathogen identification.
- Environmental and population-level surveillance can complement individual-animal sampling in pigs and poultry.
- Genomic characterisation adds information about strains, transmission and emerging threats.
- Digital reporting and connected workflows can move results to veterinary and production teams faster.

Test a sick animal → monitor a population → characterise the threat → act sooner

Genomics and digital identity push animal health upstream

Selection and traceability increasingly sit alongside vaccines, diagnostics and therapeutics



- Genomic information supports selection for health, resilience, fertility and production traits.
- Electronic identification creates the link between an individual animal, its health history and management decisions.
- Sensor-derived phenotypes could strengthen future breeding programmes, but data harmonisation and portability are still challenges.
- The opportunity is cumulative – genetics can lower baseline risk, while monitoring and veterinary tools manage the risk that remains.

Sustainability is creating a new category of animal health intervention

The toolbox is beginning to target environmental outcomes directly, not only disease and productivity



Methane-reducing feed additives

Feed interventions can inhibit rumen methane production. One well-studied inhibitor can reduce dairy cattle methane by up to roughly one-third, although efficacy and practicality vary by system.

Methane vaccines

Research aims to stimulate antibodies against methane-producing microbes. The attraction is a low-frequency intervention that could work where daily feed additives are impractical, but consistent animal trial efficacy remains a development challenge.

Health is a climate tool

Preventing disease improves biological efficiency – fewer losses and more output from the feed, land, energy and animals already in the system.

A new commercial model

Environmental interventions often deliver limited direct productivity benefit, so uptake may depend on processor incentives, carbon value, regulation or verified supply chain emissions claims.

Animal health + nutrition + emissions measurement are converging into a broader 'health and sustainability' toolbox.

What has actually scaled and what is still emerging?

A practical adoption view across food animal health

Routine vaccines	HIGH	Decades of use; growing focus on prevention
Molecular diagnostics	HIGH	Embedded in veterinary and production workflows
Electronic ID/herd software	MED-HIGH	Broad in intensive and regulated systems
Wearable sensors in dairy	MED	Increasing uptake; clear reproduction/health use cases
Computer vision	MED	Commercialising but heterogeneous by species/use case
Genomics	MED	Established in breeding; health applications expanding
AI decision support	EARLY	Rapid development; trust and integration matter
RNA vaccine platforms	EARLY	Promising but still a small slice of veterinary vaccination

The evolution is from products to connected outcomes

The recurring theme across the last decade is earlier, more targeted and more measurable intervention

1 Prevent more

Vaccination, biosecurity and genetics reduce baseline disease risk.

2 See sooner

Diagnostics, sensors and surveillance reveal change earlier.

3 Target better

Analytics and automation focus attention and treatment.

4 Learn continuously

Connected records create feedback for management, R&D and breeding.

The toolbox is additive, not substitutive – new technologies work best when they strengthen established veterinary prevention and treatment.

What does the toolbox offer?

A decade ago, animal health was centred more visibly on medicines, vaccines and episodic diagnostics.

Today, those tools remain essential but they are increasingly surrounded by sensors, molecular surveillance, genomics, digital identity and analytics.

The strategic shift – prevent more, detect earlier, intervene more precisely and measure the outcome.

The future is not one breakthrough tool. It is a connected toolbox.

