

Wearable tech for animals: An exciting new frontier



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Key Points

- The popularity of wearable tech for animals is increasing to meet the growing demand for real-time information, live tracking, and concern for the health and well-being of pets and animals
- The global market for pet wearables and livestock monitoring systems is at an estimated 14.3% and 12.03% compound annual growth rate and is forecast to reach a revenue forecast of USD 6.88 billion and USD 16.4 billion by 2030, respectively
- Location, health, and well-being monitors for pets are some of the most popular wearable pet technologies on the consumer market
- For livestock and farm animals, applications include biosensors, e-textiles, ingestibles, and biologging
- Wearables enhance communication for service dogs used for search and rescue, bomb detection, and guiding people with disabilities
- Security risks for unsecured wearable devices could leave users open to cyber-attacks and data breaches

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Adapting technology for use on animals isn't anything new. Wildlife conservationists and environmentalists have been putting tracking devices on animals and using [radio and acoustic telemetry to collect data](#) (e.g. migration patterns, demographics) since the 1950s. While these technologies provided a wealth of information on where and when animals were located, they didn't say much about what they were doing – or even how they were feeling. GPS, cameras, the Internet of Things (IoT), and sensor technologies have removed those limitations – allowing wearable tech for animals to open up an exciting new frontier of possibilities:

- Location, health and well-being monitors for pets
- Artificial Intelligence training systems for dogs
- Wearable technology for service and detection dogs
- Biosensors for livestock management
- Wearable health monitors for horses
- Ingestibles for disease detection in cows
- Biologging for wildlife conservation

As wearable [devices for health and lifestyle management](#) become increasingly popular for humans, it's no surprise that these applications are also being extended to pets and animals. Although the pet wearables and livestock monitoring industries are still in their initial stages of development, they are attracting considerable funding, and the market economy forecasts are optimistic.

Valued at USD 2,7 billion in 2022, the pet wearables market is expected to grow at a compound annual growth rate (CAGR) of 14.3% to reach a [revenue forecast of USD 6.88 billion by 2030](#). Livestock monitoring systems are expected to see similarly positive growth over the same period, with an estimated 12.03% CAGR to reach [USD 16.4 billion by 2023](#). With forecasts like this, is it any wonder that wearable tech for animals is being applied in such a range of different ways?

How are wearable technologies for pets and animals being used?

[Microchipping pets](#) is mandatory in many countries, and although this is also a type of wearable technology, it has disadvantages. For locating lost pets, it relies on someone finding and taking them to a vet or animal shelter with the appropriate scanner to read the owner's contact information. More importantly, they don't show the lost pet's exact location either.

GPS tracking devices and [smart technologies for animals](#) allow pet owners and vets to:

- Pinpoint their pet's exact location and receive smartphone alerts as soon as it leaves designated safe zones (e.g. the house and garden)
- Track movements such as activity, sleep, and sleep quality to observe health behaviours. For example, to see how excessive scratching for dogs with dermatitis changes in response to different food
- Use health monitoring platforms to track vital information such as heart rate, temperature, and respiration
- Monitor daily activity for exercise and weight management
- Provide preventative care and early diagnosis for breeds with a disposition towards certain illnesses
- Play with pets remotely

[AI training systems for dogs](#) are another frontier in wearable tech for animals that are gaining considerable interest. While the technology isn't wearable or currently available on the market, a team of researchers at Colorado State University are designing AI tech that trains dogs to obey specific commands without human assistance. The system consists of AI software, a video camera, a speaker that delivers commands, and a treat dispenser that rewards the dog when it follows an order (e.g. sit, stay, lie down) but does nothing if the dog does not.

FIDO: Facilitating Interactions for Dogs with

Occupations

A team of researchers at Georgia Tech University are working on prototyping vests for service and detection dogs fitted with sensors to help them communicate crucial information when their handler – or a situation – requires assistance. By exploring the emerging field of animal-computer interaction (ACI), project [FIDO](#) develops vests with various sensors that dogs can activate to communicate.

These [specialised vests enable dogs](#) to:

- Call emergency services
- Send a text message
- Play an audio recording requesting assistance
- Alert owners with hearing disabilities to the sounds they've heard
- Guide their owners around obstacles or alert them to dangers that should be avoided
- Expedite search-and-rescue operations: dogs don't have to leave a distressed person to go back to find their handler or search party and lead them to the site. They can activate a sensor that sends a text message alert with their GPS coordinates, stay with the person in distress, or continue looking for others.
- Interpret odours: FIDO vests with customised sensors enable military and police dogs to interpret a bomb's odour signature, indicate which chemicals are present, and help the handler better understand the bomb/threat they're dealing with

Although these applications have only been tested in lab settings, there is considerable interest in funding this potentially life-saving innovation. Watch this space for updates!

Biosensors, e-textiles, ingestibles, and biologging for livestock management and wildlife conservation

Monitors equipped with [biosensors](#) (chemical sensing devices) and e-textiles that can track vitals, food intake, disease or illness, and activity levels are some of the most popular tech tools used for livestock management. [Startups developing wearable tech for animals](#) are developing systems that can:

- Use IoT-based farm optimisation, [precision farming](#), and monitoring solutions to improve agricultural supply chain management, e.g. milk production, procurement and logistics
- Enable real-time livestock monitoring and data analysis of recorded data for disease

detection and yield enhancement

- Facilitate the development and supply of vaccine technology for treating and preventing infectious diseases in livestock animals such as poultry, swine, cattle, farmed shrimps, etc.
- Track the movement and health of horses. Motion devices attached to saddles provide insights that enhance training. E-textile blankets continuously monitor horses' heartbeat, respiratory rate, temperature, movement, and sleep patterns for health insights
- Monitor cattle diseases using ingestible biosensors. Not only does this help to detect and prevent illness, but it can also provide a rapid response to outbreaks that need to be tracked and contained

As the impact of human activities and urban development on wildlife continues to grow, wearable tech for animals is vital for the conservation of declining animal populations and their habitats. [Biologging](#) is a relatively new but powerful wildlife observation, monitoring, and management tool. Non-evasive and robust animal-tag technology can now be equipped with sensors to provide real-time information on everything from internal physiological parameters (e.g. heart rate and stomach PH) to their external environment (e.g. climate change, salinity).

Challenges and concerns regarding wearable tech for animals

The motivation behind the development of wearable tech for animals is to improve their health, well-being, and welfare. Naturally, the first concern is that these technologies do not, themselves, cause any harm or distress. As many of these technologies are still in their early stages of development, it's difficult to conclude what any side effects could be in the long term.

In addition, as we've mentioned in previous posts regarding security and [how wearables fuel big data](#), the information that these devices – if not secure – could leak remains a concern. Because large amounts of data are being collected, analysed, and shared between different users (e.g. pet owners, farmers, and vets), [animal wearables have privacy implications](#) that could lead to cyber-attacks and data breaches if left unchecked.

Final thoughts on animal wearables

As the demand for real-time information, live tracking, and concern for the health and well-being of pets and animals continues to increase, more technologies to meet that demand will become readily available. From monitoring health data in pets or livestock and enabling service animals to do their jobs better to promoting wildlife conservation and using artificial intelligence to enhance training,

there's no telling what new insights we may gain from this burgeoning field of research and development!

Do you have any experience with using or developing wearable tech for animals? Share your thoughts and let us know!

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