The Next Frontier in Animal Health: Faster, Smarter, Scalable Vaccines

As animal disease outbreaks escalate worldwide, the urgency to act has never been greater. From African Swine Fever (ASF) and Avian Influenza (AI) to Bluetongue Virus (BTV), the growing list of infectious livestock diseases is disrupting global agriculture - threatening food security, human health, and rural livelihoods, while upending trade and supply chains. ASF alone has already inflicted severe socio-economic damage on the pork industry, which supplies over 35% of global meat consumption.[1]

Against this backdrop, global leaders from across the livestock value chain will convene at Animal AgTech Amsterdam this October, where vaccine innovation is emerging not just as a promising frontier – but as an essential tool in strengthening animal health and ensuring agricultural resilience.

Why Animal Vaccine R&D Needs to Catch Up

"The implications of an outbreak go far beyond the clinical impact of the disease," says Rinse Jan Boersma, Founder and Partner at Beluga Animal Health. "They have the potential to be disruptive for the entire industry." For Boersma, Highly Pathogenic Avian Influenza (HPAI) and ASF remain among the most urgent challenges, not only because of their high mortality rates, but because they're difficult to control and costly to contain. Add to that the looming threat of Foot and Mouth Disease (FMD) and the need for faster, more adaptable vaccine solutions becomes self-evident.

Driving this sense of urgency are deeper systemic forces that increase the chance for outbreaks of infectious diseases: climate change, globalisation, and intensifying livestock production. These conditions are shifting disease patterns in ways that traditional R&D timelines can't match.

"During the past decades, we've seen an increasing occurrence, frequency, and severity of viral disease outbreaks," warns Klaus Hellmann, Head of Europe at Argenta, citing a range of high-impact pathogens from ASF and PCV2 to Lumpy Skin and Bluetongue viruses. "Therefore, the rapid development of innovative vaccines is crucial in mitigating these threats and ensuring the sustainability of the animal agriculture industry."

Challenges & Opportunities

Despite the growing threat, vaccine development for animal health continues to face steep hurdles. "The single biggest challenge is the difficulty in making an attractive business case," says Boersma. "Regulatory requirements vary by region, the timelines are long, and the risk is relatively high."

Hellmann agrees and notes that the small market size for many veterinary vaccines, especially for minor species or neglected diseases, often hinders innovation before it can gain traction. In addition, harmonising manufacturing standards (GMP) across global territories, particularly between North America and Europe, remains essential.

Even when promising candidates emerge, deployment isn't straightforward. In the case of vector-borne diseases like BTV and ASF, seasonal patterns and regional variation complicate design and delivery. Adding to the challenge, the complex structure of viruses like ASF continues to hinder development.[2]

Manufacturing and logistics add another layer of complexity. "The most important differentiation is to be able to develop and produce a product with a feasible price for the end-user," Boersma emphasizes. Scalability, cost-efficiency, and real-world usability must be built into vaccine platforms from the outset.

Despite the challenges, there is a growing sense that the sector is on the cusp of a major transformation. “Vaccine platform technologies — including DNA, RNA, mRNA, self-amplifying RNA, subunit technologies, and virus-like particles — are showing the greatest promise for rapid, scalable innovation,” says Hellmann.

These platforms use a “plug-and-play” approach: once the core system is approved and ready, scientists can quickly produce new vaccines by simply swapping the antigenic sequence – the part of a virus or bacteria that triggers an immune response – allowing new vaccines to be developed and delivered in weeks instead of months or years.

Beyond these established platforms, Hellmann also points to emerging technologies like circular RNA (circRNA), which could reduce costs by improving vaccine stability and immune response. But, to unlock their full potential, he emphasises the need for regulatory alignment and international cooperation. Tools like the EU’s Vaccine Antigen Master File (VAMF) and vaccine platform technology frameworks are, in his view, game changers as they “allow reuse of validated platform data across multiple products, streamlining approvals and reducing duplication of efforts to place vaccines faster to market.”

For both Boersma and Hellmann, true progress will depend on collaboration – not just across companies, but across governments and sectors. “Innovation in general, and especially for vaccines, requires an ecosystem with complementary capabilities and a long-term commitment,” says Boersma. Hellmann echoes this, advocating for more support for SMEs and emerging markets, where much of the disruptive innovation originates. “Innovative companies who try it will win. At this point, knowledge exchange within the industry worldwide will most likely have a very relevant impact; that includes competent authorities, industry, contract manufacturers, and consultants,” he says.

Achieving this vision requires a regulatory framework that actively enables cooperation and innovation. Harmonised manufacturing standards – such as GMP – are critical to aligning processes internationally, with the VICH process playing a central role in ensuring consistency and quality across regions, adds Hellmann. "The UK’s Veterinary Medicines Directorate (VMD) has already shown how this can work in practice, introducing flexible, innovation-supportive amendments to its Veterinary Medicines Regulations post-Brexit, with a strong emphasis on international collaboration and agile licensing pathways."

Expanding such efforts globally through cross-border scientific advice and joint assessments, particularly for novel technologies, can reduce duplication, speed time-to-market, and ensure that safe, effective vaccines reach those who need them faster, he notes.

Looking Ahead: Toward Faster, Smarter, More Equitable Vaccine Access

Looking ahead to 2030, both experts anticipate a landscape transformed by technological and regulatory shifts. “For sure, it will be different from now,” Boersma says. “The question is how new technologies like AI, increasing globalisation, and events like COVID-19 will shape the future.”

Hellmann is equally optimistic but realistic about the timescales involved. “Five years is a relatively short period in a highly consolidated industry,” he notes. “But there are various technologies on the edge of commercialization, and this includes vaccine technologies that will allow preventing infectious diseases where currently no vaccines or even effective treatments are available.”

As the Animal AgTech Amsterdam summit approaches, the message is clear: animal vaccine R&D must become faster, smarter, and more collaborative. The stakes for animal health, human wellbeing, and planetary resilience have never been higher. While breakthroughs in vaccine technology could

transform disease control and set new precedents for eradication efforts, current regulatory frameworks remain slow and fragmented.

To meet today's challenges, development pipelines must be more agile, and cross-border cooperation must increase. This is more than a call for innovation; it's a call to rethink the entire ecosystem that enables it.

Meet Rinse J. Boersma and Klaus Hellmann on October 16-17 at Animal AgTech in Amsterdam, where they'll both share more on the topic live on stage during the panel 'Innovating Animal Health: The Future of Vaccine R&D.'

*Summit passes are currently discounted by **€300** with the Early Bird offer, which expires at midnight on September 4. You can get an additional **10% discount** by using our code **EAAP10** at checkout.*

Find out more: www.animalagtecheurope.com

References

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2. HIPRA. https://www.hipra.com/en/human-health/press/european-vax4asf-project-will-study-next-generation-vaccines-against-african