The global evolution of new technology vaccines for use in the hatchery

by Sylvain Comte, Branko Alva and Pascal Paulet, Ceva, ZI La Ballastière, 33 500 Libourne, France.

Since the mid 2000s, the availability of new technology vaccines has increased worldwide and their use has expanded tremendously in the past five years, especially at hatchery level.

These new technology vaccines can be grouped into three categories: immune complex vaccines, vector HVT vaccines and vector FP vaccines. Despite their differences, they share a number of properties that make them particularly suitable for hatchery vaccination.

They have a nil to low occurrence of maternally derived antibody susceptibility, allowing homogeneous vaccine uptake whatever the chick quality. They offer very good safety, allowing early vaccination via in ovo or day old administration and they induce lifelong immunity.

This article presents the global evolution of the use of these vaccines in broiler immunisation.

In 2012, 65% of day old chick broilers received one vaccination either in ovo or subcutaneously at day one. 100% of the day-old chick layers or breeders were also immunised. In broiler production there is still a large disparity between continents as shown in Table 1.

This practice of in hatchery injection, historically based on the vaccination against Marek's disease or Newcastle disease in Asia, has widened and been reinforced by new possibilities for vaccination against IBD (infectious bursal disease), Newcastle disease and infectious laryngotracheitis. All broilers in The Americas are in hatchery vaccinated, initially against Marek's disease. South Western Europe as well as Central and Eastern Europe producers practice in hatchery injection historically for Marek's disease and increasingly for IBD and ND control.

China and South East Asia have a relatively large instance of in hatchery vaccination mainly driven by ND inoculation with oily vaccines. Africa, the Middle East and a part of Asia still have a limited level of in hatchery vaccination due to the high number of commercial broiler operations, which still vaccinate on the farm.

New technology vaccines

The number of day-old chick broilers vaccinated at hatchery level with new technology vaccines has increased rapidly in the past five years, growing from 13% in 2008 to 45% in 2012.

This represents a cumulative average growth rate close to 40% per annum from 2008 to 2012. The growth is related to the larger availability of products in poultry producing countries (based on national registrations) and the developing interest amongst poultry producers.

Amongst the three targeted major diseases, new technology vaccines against IBD are the front runners, which were the first to be introduced (from 2002 to 2008) and have the largest usage share. They are followed by ND new technology vaccines, whose percentage is rapidly expanding.

IBD new technology vaccines:

32% of day-old chick broilers received a new technology vaccine

Table I. Global injection practices in 2012.

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Broiler population ratio	Hatchery injected (%)	Non-hatchery injected (%)
North America	100	0
Latin America	99	1
Asia	56	44
Central and Eastern Europe	50	50
Africa and Middle East	19	81
Western Europe	35	65
Total	66	34



Fig. 1. The use of new technology vaccines for broilers in the hatchery in 2008 and 2012 (% of global yearly production).

against IBD in 2012. Immune complex IBD vaccines are used on a global basis except in the USA. In that country only vector HVT IBD vaccines are used.

ND new technology vaccines: These vaccines are exclusively based on vector HVT technology. They were introduced more recently (from 2008) and demonstrated the highest growth from 2008 to 2012. LT new technology vaccines: These vaccines are based either on vector HVT technology or on vector FP technology. They were initially introduced in the USA in the mid 2000s and their use in broiler vaccination is limited to the USA and a number of Latin American countries, due to specific epidemiological conditions. In 2012, 23% of global

broiler production was vaccinated with Ceva new technology vaccines.

Conclusion

As evidenced by the above figures, the use of new technology vaccines is developing rapidly in hatchery vaccination and they are becoming available worldwide.

The new technology vaccines open up fresh possibilities for disease control and management.

Poultry producers will benefit both from their reliable safety and efficacy, and equally from the advantages of the in hatchery vaccination method. They remove the need for vaccination at farm level for IBD and LT and for ND they limit the booster requirements, thus simplifying the vaccination programs.

The absence of MDA interference increases homogeneity of vaccine uptake. Recently, Ceva enabled the combination of two new technology vaccines (IBD Immune Complex Transmune IBD and Vector HVT ND-Vectormune ND) into a single dose in the hatchery, consequently giving life long protection against three major poultry diseases – Newcastle, Gumboro and Marek's disease – a significant step forward for poultry production.

In hatchery vaccination increases control and homogeneity of the vaccination process Fewer people are required to manage and train in the hatchery as opposed to a larger number on the farm. It relieves the broiler farmer from the necessity of field vaccination, freeing more time for essential activities related to rearing or farm management.

The fundamental aim for their use is 'each bird shall receive the proper dose'. Consequently, administration quality at the hatchery level is paramount to realise the full potential of the vaccine.

Poultry meat is expected to become the major source of animal protein within the next 30 years. Given the predicted trend of higher and more volatile input prices – feed and energy – optimisation of performance, at all levels, will be critical for poultry producers in the very near future.

Disease control is one of the major challenges for this desired optimal performance. The new technology vaccines combined with in hatchery vaccination bring an up to date range of possibilities in terms of vaccine safety and efficiency as well as convenience in vaccination organisation. Over the last five years, poultry producers have been enjoying the positive benefits of this cutting edge innovation.