Towards Edible Vaccines In Chickens

Dr. Kate Sutton
Vaccination on a large scale

Requirements

Cheap
Easy to produce
Easy to administer
No residual pathogenicity
Low/no boost necessary
Reduction of transmission

Applicability

Individual Application
- Injection
- Eye/nose drop
- Wing-web scarification

Mass Application
- Drinking water
- Spray
- Aërosol
- In ovo
Vaccination on a small scale

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LMIC
Small batches of vaccine
No cold chain requirements
Non-specialised applicability of the vaccine
Vaccine Advancements

- Dissolved in 1 mL of water within 10 seconds
- Small batches – one table can immunised 50 chickens
- Stable for 24 h at room temperature
- Demonstrated using a well known commercial vaccine against NDV

VetRecord

Research

Development of a low-dose fast-dissolving tablet formulation of Newcastle disease vaccine for low-cost backyard poultry immunisation

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Vaccine uptake through the Gastrointestinal tract
CSF1R-Reporter Transgenic Chickens
Proxima Concept’s Vaccine Carrier

Capsules
Proxima Concept’s Vaccine Carrier
Co-localisation of Proxima’s Oils with Peyer’s Patches
Vaccination using the Oil Carriers

**Groups**
- Oil alone
- Oil + KLH
- Oil + CTB
- Oil + CTB + KLH

**Weeks**
- Week 3: Oral Immunisation, Blood sample
- Week 5: Oral Immunisation, Blood sample
- Week 7: Oral Immunisation, Blood sample
- Week 9: Oral Immunisation, Cull, Blood & Mucosal samples
Serum IgY-specific CTB response

Week 5

Week 7

Week 9

Absorbance (450nm)

- **Oil alone**
- **KLH**
- **CTB**
- **CTB + KLH**

**Significance:**

- *: p < 0.05
- **: p < 0.01
Mucosal IgA-specific CTB response

Week 9
Results

Proof-of-principal

- Co-localisation of Proxima’s oil formulations with Peyer’s patches in the intestinal tract
- Induction of Systemic and Mucosal immune response post-oral immunisation

Future Prospects

- Potential to deliver vaccine proteins to the mucosal immune system
- Oral administration
- Cheap to produce
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