



Vaccination Application: Current and Future Trends

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VACCINATION CHANGES OVER THE YEARS: HATCHERY INJECTABLES

Manual



Semi-automated



Automated



EXAMPLES OF HATCHERY VACCINATION EQUIPMENT



Ovo-Jector



Zootec Double II



HATCHPAK Cocci



Spra-Vac Line



Spra-Vac II



Ovo-Xtractor

Hatchery: *In Ovo* / Subcutaneous Injection / Spray

EXAMPLES OF FIELD VACCINATION DEVICES



Farm: Spray, Injectables



ThaMa
Single Syringe



ThaMa
Pox Syringe



EZ Ject



UlvaVac



Layer SprayPac



SoloVac III



Field Spra-Vac



SprayCart Dual

Vaccination Moving From Farm to Hatchery

Consistent
vaccination of
every bird

Easier to train
personnel

Challenges to
water vaccination
at farm

Hygiene is poorer
at farm

Easier to spray in
chick box than
chicken house

Climate

Less labor
intensive

In ovo vaccination process



Automated single process including:

- Candling to detect non-viable eggs and their removal
- Vaccines delivery by individual injections in a mass application
- Eggs transfer from incubation trays to hatcher baskets.



Benefits with *in ovo* vaccination

Accurate and uniform vaccine administration

Automation helps to assure that each chick embryo receives a full and precise dose.

Early stimulation of immunity

Vaccine administration to embryos vs. chicks stimulates the immune system earlier, depending on vaccine.

Less chick stress

Vaccination during incubation reduces the need to handle and inject chicks.

Lower cost of labor

Automation reduces the total cost of labor in terms of wages, injury and management time.

Faster chick processing

With less need to handle and inject chicks, they can leave the hatchery sooner.



The addition of the Ovo-Jector and the Ovo-Xtractor is another example of Boehringer Ingelheim's commitment to strengthening our partnership with our customers.

Operational video OX and OJ



S Q V A C C I N A T I O N



Zotec Double II



- Dose
- Hygienic handling (Sterile Injectable pieces)
- Consumption time
- Vaccine mixing with correct handling

A FREESTANDING VACCINATOR FOR HATCHERY MASS SPRAY VACCINATION



The modern,
cutting edge
design of the
Spra-Vac Line

Spra-Vac Line Features:

- Automatic spray control technology system
- User-friendly touch screen
- Pulse Width Modulation (PWM)
- Key vaccine flow sensors to alert the operator
- Adaptable to different conveyor configurations and belt speeds

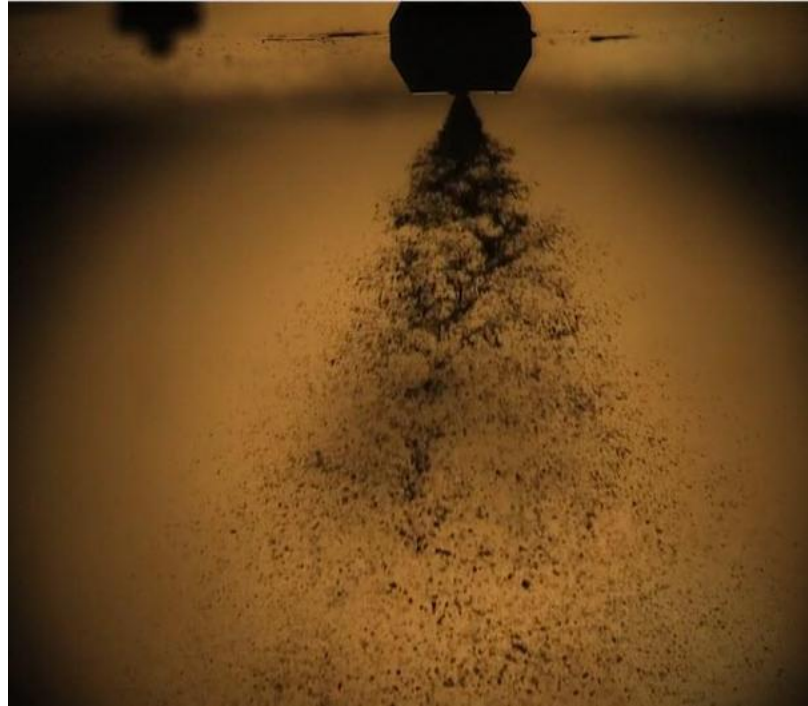




Laboratory Testing:

Spray Parameters

- Droplet Size
- Pattern
- Uniformity
- Distribution



Vaccine application

Parameters to review



- Volume is correct
- Spray Pattern /Coverage/Uniformity
- Hygiene
- Correct air pressure in the machine
- Reduce vaccine waste





Farm Vaccination

Field Spray Application



Farm Injectable Vaccination



Pullet vaccination



Inactivated oil emulsion vaccines

Digital Solutions



The VR 360 Interactive Application



Ovo-Xtractor

Ovo-Jector

+

Ovo-Jector interactive

- 360° rotation of the machine
- Utilize a controller to rotate the machine and click on the different points
- that highlight the machine features and to view a video clip and text
- Tradeshows (Global and Local)

How It Works?

Vaxxitek Mixing and Handling Interactive:

- 360° view from inside a mixing room
- The user can move to different areas, i.e. mixing counter and vaccine dewar, within the mixing room

Each area will consist of:

- A video clip for the user to watch
- An actual practice session where the user **utilizes their own** hands to perform a M&H procedure
- A True or False quiz to test their knowledge of the M&H process



Smart Glasses



Smart Glass-enabled capabilities & processes

Smart Glasses are a **portable, hands-free, secure** remote assistance solution on smart glasses for real time **collaboration** between field or on-site technicians and remote experts – anywhere, anytime.



Human hair magnification
using Dino digital microscope



Excellent resolution from Flir
one (19,200 pixels (160 × 120))

Future Technologies



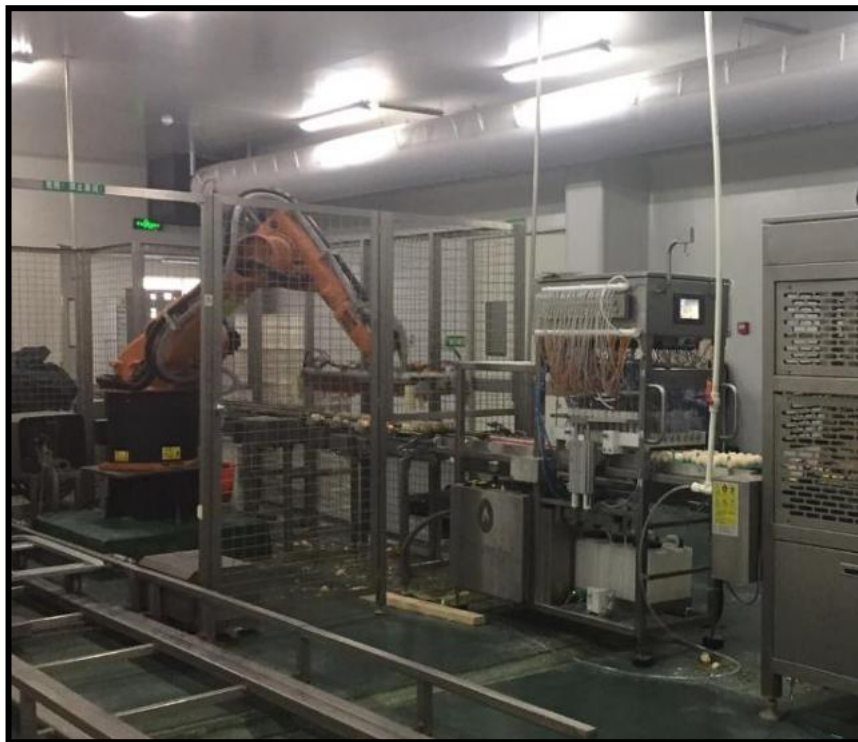
Future Trends for Vaccination Application

More
Automation

Precision
Farming

Sustainability

Automation



Reduction of labor force

Technology is constantly changing and evolving using vision, robots, artificial intelligence

Need for automation to support field vaccination as well as hatchery vaccination

Precision Farming

- Smart technology – verify vaccination
- Data collection
- AI – Artificial technology
- Alarms to identify when Preventative Maintenance is needed on vaccination equipment
- Smart Dewar technology



Liquid nitrogen level monitoring

High ambient temperature alert

Connection to the Cloud

Location tracking

Sustainability

- Reduction of carbon footprint
- Animal welfare policies
- With ABF, NAE, etc. all equipment needs to have automatic cleaning
- All equipment needs to validate cleaning procedures conducted
- Automated cleaning on all equipment



Opportunities and Challenges Ahead



Labor force reduction

Skillset of labor force

Industry is moving to larger hatcheries/farms to vaccinate quickly to not impact broiler/breeder/layer performance

Need to educate the importance of vaccination

Always keep up with new vaccine technology or industry changes

Keep it simple

Thanks for your attention!

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