Vaccination equipment, status and future expectation.

Carlos Gonzalez Alonso, Global Technical and Marketing Manager for vaccination Equipment and Services, Ceva Group, France
1. Vaccination Equipment Market 2012

2. Hatchery Vaccination Equipment Review:
   - Sub Cutaneous Vaccination
   - In-Ovo Vaccination
   - Spray Vaccination
   - Gel Applicators

3. Conclusions
1 - Vaccination Equipment Market 2012
Today and Tomorrow
POULTRY PRODUCTION

Increase of volumes *(Meat and Eggs + 30% in 10 years)*
Poultry Industry Pressures and Plans

- Competitive meat pricing: Maintain margins by differentiation
- Food Safety cost: Limit drug usage
- High input: Optimize input ROI
- Labor availability & skills: Simplify and automate processes
- Disease pressures: Maximize disease prevention

Direct Impact of Vaccination Equipment
Hatchery Vaccination Practices - 2012
In ovo & Day-old injection (Broilers)

- **North America**: 100% Hatchery Injected, 0% Non Hatchery Injected
- **Western Europe**: 41% Hatchery Injected, 59% Non Hatchery Injected
- **Central and Eastern Europe**: 49% Hatchery Injected, 51% Non Hatchery Injected
- **Latin America**: 97% Hatchery Injected, 3% Non Hatchery Injected
- **Africa and Middle East**: 20% Hatchery Injected, 80% Non Hatchery Injected
- **Asia**: 52% Hatchery Injected, 48% Non Hatchery Injected

**Legend**:
- Orange: Country practicing hatchery Injection (> 10 % of production)
- Blue: Country NOT practicing hatchery injection (< 10 % of production)
Broiler Hatcheries by SIZE (eggs/week)
TOP35 Countries - 2012

- <1M
- 1M > X >750K
- 750K > X >250K
- >250K

978
287
286
578
Injection Equipment
Injection Equipment
Main Figures

<table>
<thead>
<tr>
<th>Region</th>
<th># Sub-Q</th>
<th># In-Ovo</th>
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<tbody>
<tr>
<td>Africa &amp; Middle East</td>
<td>385</td>
<td>4</td>
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<td>Central &amp; Easter Europe</td>
<td>545</td>
<td>13</td>
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<tr>
<td>Latin America</td>
<td>183</td>
<td>2025</td>
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<td>Western Europe</td>
<td>495</td>
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<td>North America</td>
<td>1250</td>
<td>582</td>
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<td>TOTAL</td>
<td>7550</td>
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</table>
Injection Equipment

Main Figures

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% Sub-Q  % In-Ovo

TOTAL

Asia

Africa & Middle East

Latin America

Central & Easter Europe

Western Europe

North America

North America

0  20  40  60  80  100

0  12  8  33  5  18  50

21  8  50  50

88  92  67  95  82
Injection Equipment
Main Figures

# In-Ovo

TOTAL 753
Argentina 18
Canada 20
Spain 21
Japan 24
Brazil 130
North America 540

91% Total # In-Ovo in 6 Countries
Some years ago….

Only one type of Vaccine Available for In-Ovo (MD)

Present and Future

Vaccines Available types of Vaccines Available for In-Ovo (MD, IBD, ND, LT, AI, …)
Sub-Q Equipment
Sub-Cutaneous Equipment

**PROS**
Cheap and practical
+97% Efficacy
Easy maintenance

**CONS**
Constant control
Human factor
Operational limits
Sub-Cutaneous Equipment
Sub-Cutaneous Equipment
Sub-Cutaneous Equipment

**PROS**
- SQ + Spray
- +97% Efficacy
- Minimize the human factor

**CONS**
- Constant control
- Still some human factor
- Operational limits
Sub-Cutaneous Equipment
## Sub-Cutaneous Equipment

### CONCEPT

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<tr>
<th>Concept</th>
<th>SQ</th>
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<tr>
<td>Optimal Vaccination Efficacy</td>
<td>+97%</td>
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<tr>
<td>Maximum Recommended Speed</td>
<td>2500-3000 DOCs/hour</td>
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<tr>
<td>Maximum Recommended Time of Operation</td>
<td>6 hours/operator</td>
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<tr>
<td>Maximum Output/Day</td>
<td>18,000 DOCs/operator/day</td>
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<tr>
<td>Recommended Maintenance</td>
<td>1.5 hour/SQ vaccinator/week</td>
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</table>
In-Ovo Equipment
In-Ovo Equipment
<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>Standar In-Ovo</th>
<th>Small In-Ovo</th>
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</thead>
<tbody>
<tr>
<td>Optimal Vaccination Efficacy</td>
<td>+98%</td>
<td>+98%</td>
</tr>
<tr>
<td>Maximum Recommended Speed</td>
<td>50-70,000 eggs/hour</td>
<td>10-15,000 eggs/hour</td>
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<td>Number of Operators</td>
<td>4-5</td>
<td>1-2</td>
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<td>Maximum Recommended Time of Operation</td>
<td>8 hours</td>
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<td>Maximum Output/Day</td>
<td>400,000 eggs/day</td>
<td>60-120,000 eggs/day</td>
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<td>Recommended Maintenance</td>
<td>15-20 hours/week</td>
<td>5-10 hours/week</td>
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</table>
**PROS**

- Safe and massive method
- +98% efficacy
- Not human dependent
- High Output
- Precise: location and dosage
- Early immune system triggering

**CONS**

- More expensive than SQ (?)
- Requires good bio-security (?)
- Sensitive to embryo development
- Not recommendable for dirty eggs
- Sensitive to egg shell quality problems
Broiler Hatcheries by SIZE (eggs/week)
TOP35 Countries - 2012

- <1M: 287
- 1M> X >750K: 978
- 750K> X >250K: 578
- >250K: 286

Standart In-Ovo

SQ
Broiler Hatcheries by SIZE (eggs/week)
TOP35 Countries - 2012

- Standar In-Ovo
  - <1M
  - 1M> X >750K
  - 750K> X >250K
  - >250K

- Small In-Ovo

SQ

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Spray Equipment
Main Figures
Spray vaccination in the hatchery covers approx. 98% of the Broiler and 100% of the Layers/Breeders industry.

IB, ND and Coccidiosis, in most of the cases.

Type of equipment in use defined by:
- Hatchery size
- Automation level
- Labor costs
- Disease pressure
Spray Vaccination Equipment
Key points

- Size of the Droplet
- Volumen Media Distribution
- Distribution Pattern
- Air-Pressure stability
- Local conditions (HR%, temperature)
- Type of nozzles
Spray Vaccination Equipment

Key points
Spray Vaccination Equipment
Back-Packs

Small production
Low labor cost

**PROS**
- Easy to use
- Cheap option

**CONS**
- Energy consuming
- Droplet size is variable
- Distribution pattern is weak
- Low Output
- Operator dependant

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Spray Vaccination Equipment
Semi-Automatic Cabinets

Small-Medium production
Not Automatized Hatcheries
Low labor cost
Max. 30-35K DOCs/h

**PROS**
- Easy to use
- Low Price
- Vaccination efficacy can be high

**CONS**
- Energy consuming
- Distribution pattern depends on nozzles
- Low Output
- Operator dependant (chicks management)
Spray Vaccination Equipment
Automatic Sprayers

Medium - High production
Automatized Hatcheries
80-90K DOCs/h

**PROS**
- Integrated in the Processing Line
- Vaccination efficacy can be high
- No human factor
- Supplied by the Automation provider

**CONS**
- Not reliable if not well maintained
- Supplied by the Automation provider
- Speed dependent (trays are stopped)
Spray Vaccination Equipment
Automatic Sprayers
Spray Vaccination Equipment

What is coming new?
Spray Vaccination Equipment
What is coming?

ELECTRONIC BACKPACK
Electric rechargeable-battery
Dosage & pressure is constant
Easy to use
Flow regulator
Ergonomic
Spray Vaccination Equipment
What is coming?

CONVEYORED CABINETS
Eliminates the Human Factor
Adjustable Delay-Time Post-Spray
Flow regulator: dosage and pressure
Faster than current cabinets (up to 70k DOCs/hour)
Auto-Clean In Place
Spray Vaccination Equipment
What is coming?
Spray Vaccination Equipment
What is coming?

SMART IN-LINE SPRAYERS
Adaptable to all types of crates and conveyor speeds
Flat Nozzles improve the spray distribution pattern
Clean-In Place system
Traceability and Monitoring
Faster than current In-Line Sprayers (up to 120k DOCs/hour)
Spray Vaccination Equipment
What is coming?
Spray Vaccination Equipment
What is coming?

SMART IN-LINE SPRAYER
SUMMARY: What is coming new?

1. Elimination the human factor
2. Adaptability
3. Better spray distribution
4. Droplet size accuracy and adequate VMD
5. Auto-Clean In Place
6. Traceability and Monitoring
Spray Vaccination Equipment

Main Figures

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TOP 35 Countries 2012

- **Total**: 6320
- **In-Line Equipment**: 890
- **Semi-Automatic Equipment**: 1230
- **Manual Equipment**: 4200

# Equipments
Coccidiosis Vaccination Equipment
TRADITIONAL SYSTEMS
By spraying water based-vaccines onto DOCs
Demands specific equipment with shaker
Normally vaccine waste is too high
Spray distribution patterns affect on vaccination efficacy
Size of the droplet needs to be very homogeneous
Coccidiosis Vaccination Equipment

GEL DISPENSER
Patented gel based vaccines application
Vaccine waste is minimum
Spray distribution patterns is constant
Size of the droplet is constant
Coccidiosis Vaccination Equipment
Coccidiosis Vaccination Equipment

What is coming?

**GEL DISPENSER RANGE**
Adaptable to all type of hatcheries
Available as well for field/farm vaccination
Flow regulator: dosage and pressure

High Output: 70k (Stand Alone) to 120k DOCs/h (In-Line)
Auto-Clean In Place

Stand Alone

In-Line
SUMMARY & CONCLUSIONS
Main Trends on Vaccination Equipment

- **Hatchery Injection** represents 66% of total Broiler production vaccination and 100% in Broiler/Layers. For **Spray vaccination** approx. 98%.

- Significant trend towards **In-Ovo vaccination** (out of US) due to **availability of new technology** vaccines and production concentration in **bigger modern hatcheries**.

- **Spray vaccination** moving to a **next step** in terms of application quality, biosecurity and userfrienliness.

- **Irruption of new Gel applicators** for Gel vaccination.
The appearance of new technologies vaccines in the market reinforces the need ensuring a high vaccination efficacy index.

The trend towards bigger capacity and more sophisticated hatcheries highlights the need of more automatization and high-outputs vaccination equipments.

Strong competition and pressure on cost reduction combined with growing HR costs leads to optimize the human factor needs in the hatcheries.

Biosecurity and food-safety constrains push towards better controled and animal-friendly methods of vaccine application.

Vaccination equipment has to fulfill all the requirments and needs of the producers.
Thanks for your attention !!!