

# SmartVac™

## Next generation in-ovo vaccination and nutrition



SmartVac™ is a new, patented technology that allows 100% safe, consistent and accurate in-ovo vaccination and nutrition. It delivers the injectables only into the amniotic fluid, thus preventing possible injury to the growing embryo.



## Benefits

### Earlier immunity

SmartVac™ provides earlier exposure to various vaccines and nutrients, supporting early development of the immune system and improving the birds' health and disease resistance.

### In-ovo feeding

SmartVac™ positively affects the chick's vitality, early growth and gut health. Adding nutrients while the chicken is still in the egg helps improve the day old chick weight, growth performance and breast muscle weight of broiler chickens.

### Animal welfare

SmartVac™ birds are less stressed when vaccinated in-ovo. Possible injury to the live embryo is avoided because the system

only injects into the amniotic fluid. Minimal post-hatch chick handling reduces stress and improves comfort.

### More consistency

SmartVac™ reduces possible human error, with fewer people needing to be trained and monitored than with manual subcutaneous vaccination.

### Reduced labour costs

SmartVac™ in-ovo vaccination significantly reduces the labour required, compared to subcutaneous vaccination of day old chicks.

### Uniform delivery

SmartVac™ uses an automated and uniform process to deliver constant volumes and concentrations of vaccines and nutrients to each embryo, regardless of the size of the egg or embryo.

### Reduced processing time

SmartVac™ reduces processing time from hatcher to farm, eliminating the need for post-hatch vaccination. This means that day old chicks have faster access to food and water, which improves chick quality.

### Controlled hygiene

SmartVac™ ensures controlled hygienic conditions, by maintaining a sterile environment in and around the injection area.

### Selective inoculation

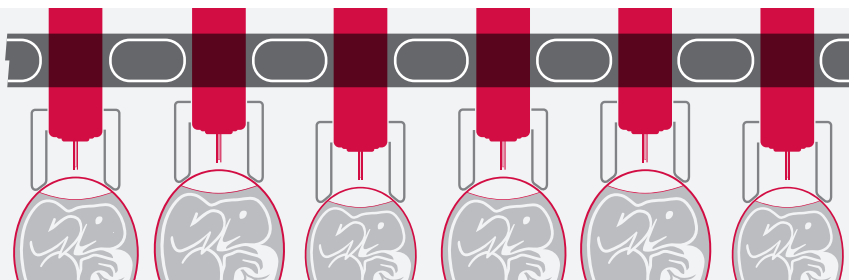
SmartVac™ applies selective inoculation by identifying non-viable eggs (infertile or early deads) and empty egg positions on the setter tray, thus reducing vaccine waste.

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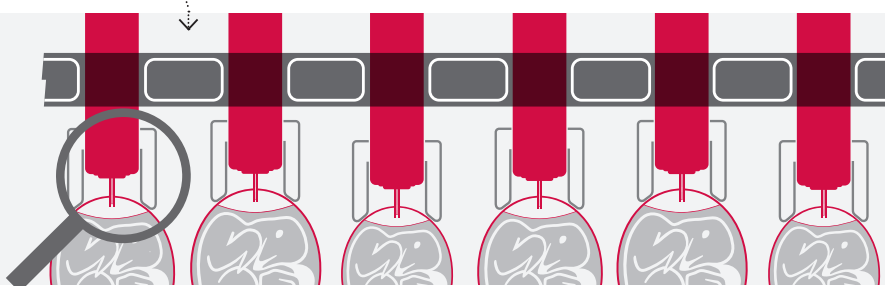
## How it works



**1** The injector head descends until the injector's guiding cups touch the shells of each egg in the setter tray. The injectors are not yet fixed, so that their position can be adjusted to the different egg sizes.



**2** Special air tubes between the injectors inflate, locking the injectors in the ideal position. The injector head then makes a second fixed, downward movement, causing the injector's outer needles to pierce the shell collectively and precisely.



**3** To allow automatic and individual adaptation of the injection depth to each single embryo (regardless of egg size and flock age), the inner needles in each injector then descend individually.



**4** The inner needle pierces the membrane and makes another controlled downward movement into the amniotic fluid.



**5** The Embryo Soft Touch® sensor detects the position of the embryo and the needle movement stops. Retracting slightly to avoid any injury to the embryo, the inner needle remains in the amniotic fluid.



**6** 100% of the injectable is delivered safely and precisely in the amniotic fluid around the embryo.



**7** As the injector head retracts to the starting position, a sanitisation solution flows down the needles – disinfecting the system and maintaining a sterile environment.

