Perfect point-down setting: a critical factor for hatching eggs

Ensuring successful hatching of eggs involves a lot of care and attention to detail. The perfect point-down setting is a critical factor that should not be overlooked.

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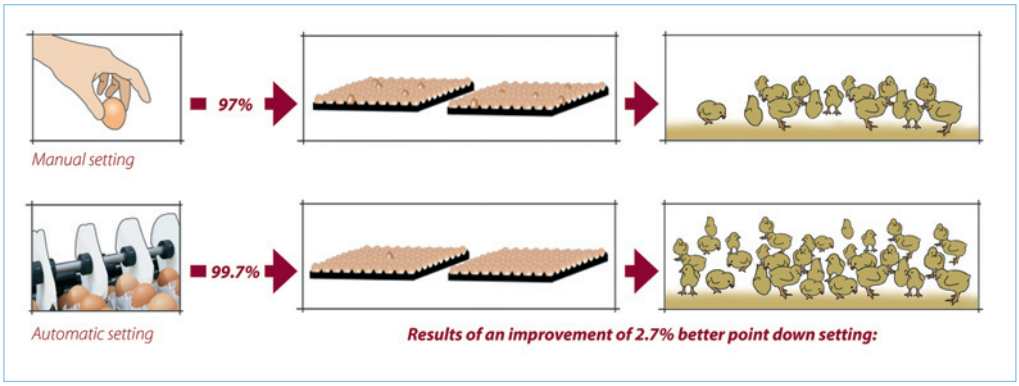
Getting this right can make all the difference in the number of eggs that hatch, resulting in more healthy and sellable chicks.



Why is point-down setting important?

Have you ever wondered why it is important to make sure your eggs are placed small end down? While many people assume the shape of the egg plays a role, research has shown that it is actually more often human error that leads to eggs being set upside down.

This can happen to varying degrees, with some trays containing no upside-down eggs while others have up to a dozen. Unfortunately, setting eggs small end up can significantly decrease their hatchability – by as much as 27.3%.

And while the percentage of non-viable chicks varies between batches of eggs, the loss of sellable chicks can add up quickly when not placed point down.

A hatchery loses 0.2% of sellable chicks for each 1% of fertile eggs placed with the small end up in a setter tray.

Point-down setting can be done manually, but ideally, this is an automated process. Automation in this case does not only mean saving labour. Actually, even more importantly moving to an automated point-down setting will reduce inconsistencies and prevent errors.

Switching to Prinzen's machine point-down setting can increase accuracy to a staggering 99.7%. Just imagine the possibilities: if you set 1 million eggs per week, that is 365,040 more sellable chicks per year.

Not to mention those chicks will perform better with 2% less mortality until 35 days, 38g more body weight, and a 0.02 lower FCR compared to chicks that hatch from eggs with the point up.

Correct point-down also can enhance the process of in ovo vaccination, leading to even more significant improvements in the egg-hatching process. As it can contribute to preventing the loss of potential chicks due to incorrectly positioned embryos (A).

And in addition, placing eggs with the air cell down and the small end up can cause the embryo's head to be positioned away from the air cell, potentially leading to difficulties with lung breathing and even the embryo's death (B).

The correct point-down setting will mean that the embryo is positioned properly allowing breathing to begin as early as day 18. This results in a smoother and more successful hatching process.

Successful hatchery automation

Within a hatchery point-down setting is not the only factor to recognise in the full chain of effective management from de-stacking to loading the eggs.

The type of hatchery will determine the most suitable solutions matching the needs of broiler or layer chicks, as well as the specifications of different incubator systems.

Gentle egg handling for hatchery automation

Every day already over 30 million hatching eggs are carefully handled and set by Prinzen machines worldwide. Hatchery automation includes the loading of eggs from the classic 30-cell tray or a setter tray onto the egg handling system consisting of operations such as candling, grading in weight categories for uniform sizes.

Sorting by exterior quality and by weight will reduce the usage of energy and waste, resulting in a more constant and predictable output.

In addition, the loading of setter trays into the setter trolley can be automated with the Trolley Loader.

The individual machines each have an effective operating capacity of 30,000 eggs per hour, depending on the type of setter tray. By combining several machines, a capacity of 90,000 eggs per hour can be reached to suit the demand for bigger numbers. The various possible

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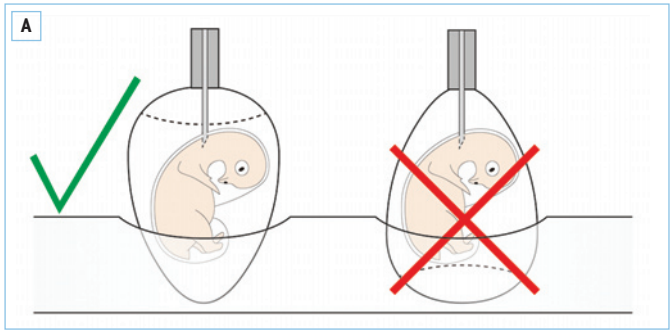

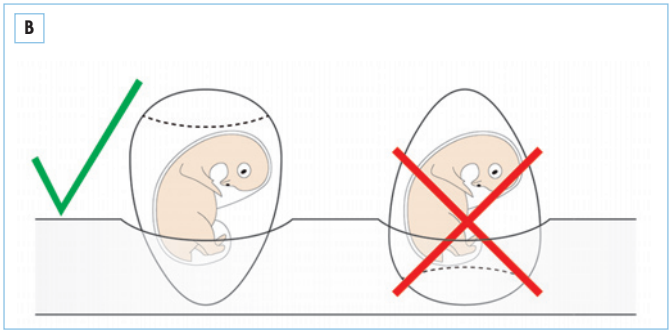

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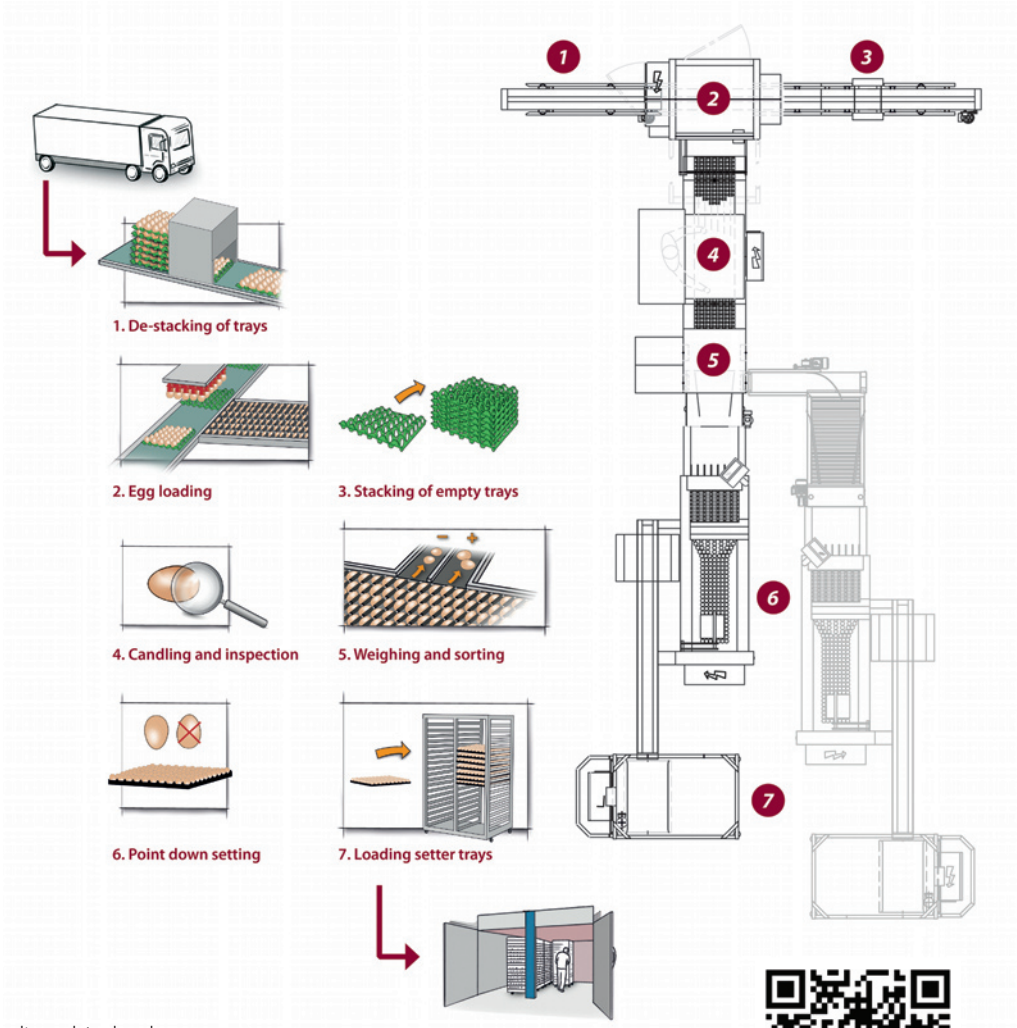
system configurations all offer a clear overview, full egg control, and ergonomic workplaces for staff.

All Prinzen machines are made from robust and durable materials. Special attention is given to specific mechanical and electronic parts to enhance the daily operation and make it extra suitable for hatcheries.

Vital parts are easily accessible for cleaning, service, and maintenance. When looking for optimum hatching results and automation of the egg intake process, Prinzen offers the perfect setting that will streamline your process and improve your bottom line.



❶ De-stacking of trays

Hatching eggs can enter the hatchery via different ways, most common is on a transport tray, 30-cell egg tray, mostly in a stack of six trays. These trays can either be made of paper or plastic.

The De-Stacker automates de-stacking to a single tray in the correct position for the next step of the process. Stacks are placed on a conveyor belt and forwarded to the De-Stacker unit.

This unit lifts the stack up from the second last tray in the stack, leaving one tray on the conveyor to continue its way in the process. The unit turns 90° after every tray release for seamless de-stacking of the entire stack to single trays and in the correct orientation. The De-Stacker can also handle stacks of specific setter trays holding 36 or 42 eggs.

❷ Egg loading

Rollers are used for moving the eggs through the egg handling system while enabling quality inspection such as candling and grading. The System Loader receives individual trays of eggs and lifts the eggs by means of vacuum from the tray onto the rollers.

The vacuum lifters safeguard gentle egg handling. The vacuum head transfers the eggs towards the rollers, where eggs will be brought in a horizontal position. The unit handles 30-cell trays as well as setter tray types carrying different number of eggs in various tray patterns.

❸ Stacking of empty trays

Once the System Loader has lifted the eggs from the tray, empty trays continue their way to the Empty Tray Stacker. This optional unit stacks 30-cell trays and releases the stack for further transport. The stack moves automatically to the end of the conveyor, where it can be removed manually.

Maximum stack height is easily adjusted. It also detects trays carrying an egg stuck, and separates these from the stack. The Empty Tray Stacker reduces manual labour and is suitable for paper and plastic trays.

❹ Candling and inspection

Once eggs are in a horizontal position on the egg rollers they can be fully inspected for misshapes, cracks, or defects. The turning rollers ensure that each individual egg can be inspected from all sides and poor-quality eggs can be manually removed.

The Candling unit has lights situated under the rollers, enhancing greatly the manual inspection for cracks and internal egg defects. Light is directed with deflectors straight to the eggs and avoids blinding by the operator.

In addition, a curtain completes the candling booth and limits the influence of surrounding daylight during operation.

❺ Weighing and sorting

The Ovograder, a grader and sorter by egg weight, has proven to be an asset at the hatchery. The system uses electronic weighing units, grading eggs into user-defined sizes, for example weight ranges. It opens the possibility to sort egg sizes to suit specific incubation programmes or processes to increase hatchability, but foremost increase uniformity in chick size.

The compact design of the Ovograder fits perfectly in the system and offers the possibility to sort and direct eggs within the same weight range to one or multiple Ovoset Pro eggs packers.

Eggs with unsuitable weight for hatching are discharged to a packing shelf to gather reject eggs manually. The grader collects statistical information such as the number of eggs, individual and total egg weights per day, per breeder house and the percentage of eggs in various weight classes. This data can be collected daily and transferred to a PC for data acquisition and further analysis for accurate management of egg production or feedback to suppliers.

❻ Point down setting

Accurate point-down setting of hatching eggs onto setter trays is an essential condition for maximising hatchability and results. Prinzen is known for its unsurpassed point-down setting rate of 99.7%. The rotating movement of roller tracks orientates eggs with their pointed ends towards the outside of the rollers. At the end of the track eggs are tipped into the cups. Gravity ensures that the eggs are positioned point down. The cup conveyor brings the eggs to the vacuum transfer unit. Here eggs are lifted and positioned point down in the setter trays. The Ovoset Pro handles various setter tray types and can create various patterns in order to set eggs to both rectangular matrix or hexagonal structured setter tray patterns.

❼ Loading setter trays

The Trolley Loader is an additional option that completes the automated egg-handling process. It is designed for the fully automatic loading or unloading of various transport – and setter trolley types of the incubator companies.

Setter trays are conveyed by the tray lane of the packer onto an automatic trolley feed unit, which gently pushes trays into the tiers of the setter trolley.

Besides substituting heavy and repetitive manual labour of placing

setter trays into trolleys, it also eliminates the risk of damaging hatching eggs.

Tray to tray transfer solution

In situations where eggs are supplied to the hatchery with suitable weights and point-down correction, the transfer from a 30-cell tray to the setter tray can be automated with the Transformer. This unit handles eggs in large numbers per hour and is designed for the 150-egg-type setter tray.

The machine consists of an infeed conveyor for stacks, automatic (de-)stacking of empty trays, automatic supply of setter trays and vacuum-operated transfer units to set eggs gently onto setter trays.

Additional equipment like the Trolley Loader can be added to load trays in the setter trolleys.

Watch Jiusanling Hatchery in China via the QR code on the previous page.

Reducing eggshell damage

When it comes to transporting delicate goods like hatching eggs, every transition point in the Egg Way is critical. When not aligned properly, it brings a potential risk of high G forces creating hairline cracks, reducing the hatchability of the egg or even worse losing the egg before it even reaches the incubator.

Scientific research has shown that decreasing G-forces down to 20 G can reduce crack occurrence from 7.7% to 0.3-1%. Studies have also shown that hairline cracks in hatching eggs can result in 40% less hatchability.

You might wonder how you can measure the G-forces the eggs have to withstand. We do this with our Gregg, Smart Green eggs. The Gregg eggs measure the G-force levels an egg is faced with when moving across the different parts of machinery.

At Prinzen, we use an electronic egg, called the Gregg Smart Egg that measures the acceleration (G-force) for each transition of the machinery. This means the risk of damaged eggs is minimised at all the different transfer points. In fact, using Gregg Smart Eggs can cut egg shell damage by a factor of up to 10.

The good news is that even if you do not have Prinzen hatchery equipment the Gregg Smart Eggs can still be used to verify G-forces across this equipment. Find out more about the Gregg Smart Egg by scanning the QR code above. ■

References are available from the author on request