



WHITEPAPER

a new strategy for  
**animal-friendly beak  
treatments in  
broiler breeders**

CHOOSING A SUSTAINABLE SOLUTION:  
BEAKS ARE SMOOTHED WHILE FEEDING



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# 1. Beak treatments for broiler breeders: a declining trend worldwide

## Beak treatment, the remedy for aggressive pecking

Beak treatments for chickens are an important remedy for feather picking and cannibalism. This behavior is the cause of many infections and can lead to increased mortality. It explains why beak treatments are routine in the poultry world. But our **attitudes towards animal welfare change over time** and practices that were previously commonplace are now thrown into question. This is also the case with beak treatments. Do they have a place within 'animal welfare'?

The two types of beak treatments used today have *advantages* but mostly numerous *disadvantages*, including the impact on animal welfare. A short summary:

1. Nowadays, **infrared (IR) beak treatment** is the most frequently used method. This treatment is carried out in the hatchery in an environment with a high level of biosecurity. After the IR treatment is completed, the tip of the beak is still intact. However, between day 14 and 21 following the treatment, the treated tissue erodes and the tip falls off. There is no open wound but the chickens experience pain and numbness in the beak. In addition, neuromas can form (swelling around nerves). The beak also continues growing after the treatment, which often results in an unnatural and irregular beak shape. In some cases, split beaks can form and the weaker scar tissue can break off.
2. **'Hot-blade' debeaking** is carried out at poultry companies by experienced people in an environment with a lower level of biosecurity. The tip of the beak is removed mechanically. There is an open wound that bleeds and can get infected. This increases the likelihood of death, partially because catching and debeaking the birds is stressful in itself. On the day of the debeaking, staff dim the lights and fast the chicks. This can have a far-reaching impact, lasting even into the production phase.

## The role of governments

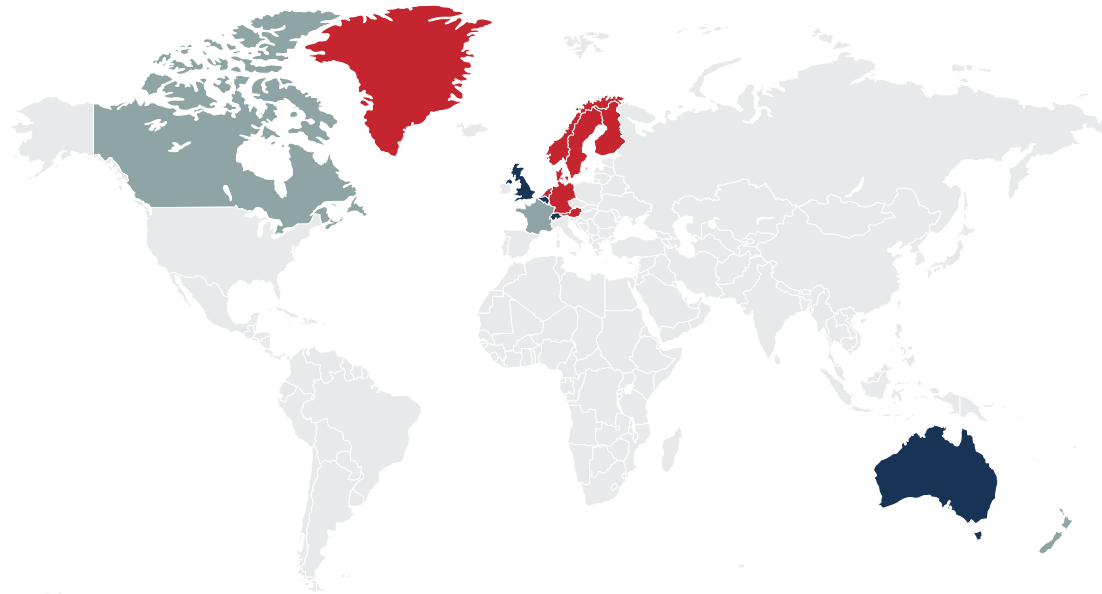
For governments in many regions, the socio-economic trend of 'improving animal welfare' is high on the agenda. Now that there are alternatives to beak treatments on the market, certain countries have already banned them:

- / The **Scandinavian countries** were the pioneers, and **Austria, Germany** and **the Netherlands** have also changed their legislation in recent years.
- / Five more countries are considering putting a stop to beak treatments: Belgium, Luxemburg, Switzerland, Australia and the United Kingdom.
- / In **France, Canada and New Zealand**, there are currently no plans for legislative changes, however, there are guidelines meaning beak treatments are not always permitted.

There is no doubt that this list will expand in the coming decade.

## Poultry companies are choosing sustainability

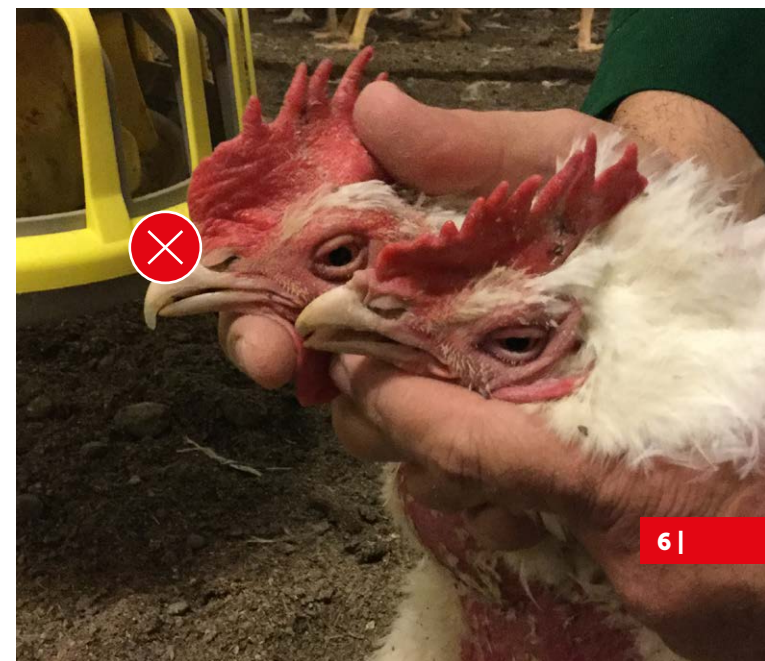
**Breeders and poultry companies** understand that times are changing. A company that wants to be **sustainable will lack credibility without high standards of animal welfare**. Poultry companies are therefore eager to test out alternatives to beak treatments — as long as it makes economic sense, of course. If new techniques are found to be animal friendly and optimize feed costs and returns, the sector is very open to new alternatives to beak treatments.



## 2. **Research** into alternatives to beak treatment

### Is no beak treatment a viable alternative?

Chickens peck each other to establish a hierarchy. Also, the mating behavior of a cockerel can cause injury to the back of a hen's head. In intensive poultry farming this can lead to problems. Feather picking and external injuries can rapidly spiral into cannibalism, making mortality skyrocket. If the situation gets totally out of control, you can lose a third of the group. The financial risks should not be underestimated. Therefore, it's not without reason that the sector is concerned about stopping beak treatments altogether without an alternative. The downsides are evident from the tests that Roxell has carried out over the past few years. If there is no beak treatment at all, **beaks develop severe overbites and very sharp tips**. This leads to extra deaths and an explosive increase in feed waste. Our tests show that a hen **without beak treatment drops an additional 9.5 grams (0.34 oz) of feed while eating per day** compared with a hen with an IR treated beak. This is because efficient eating and drinking is hindered by poorly shaped beaks. Ultimately, this has a knock-on effect on the flock's uniformity.



## Five years of research by Roxell

In 2013, Roxell — manufacturer of house equipment — decided to do research into a product innovation that would render beak treatments completely unnecessary.

The question we wanted to answer was: **how can we 'control' the growth of beaks in broiler breeders in a completely pain-free way while they eat?**

An idea developed to integrate a metal file into the bottom of our feeder pans, so every time broiler breeders eat their beaks rub against the file. The birds should have beautifully smooth beaks before the end of the rearing period. Research began at the Roxell Innovations Center in Maldegem (BE) and in a later phase moved to rearing and production houses. We also cooperated with the large breeding companies — Aviagen, Cobb and Hubbard — and integrated their feedback. Following an intensive testing period, this product innovation was shown to work perfectly. We named the solution: **'Natural Beak Smoothing'**.



## The result = Natural Beak Smoothing for broiler breeders

In 2018, Natural Beak Smoothing was ready to be sold. The method works as follows:

- / The bottom of the feeder pan has been fitted with a *rough texture* made of metal.
- / When the chickens eat, their beaks rub against the rough texture of the pan bottom,
- / which controls the growth of their beaks in a natural way. As a result, the chickens develop well-formed beaks.

Natural Beak Smoothing can be integrated into each of Roxell's oval feeder pans for broiler breeders.

Roxell's Natural Beak Smoothing solution is one of the most **innovative feeding concepts** on the market today.

Results show that the growth of the beaks is kept under control from day one. **After fourteen weeks of rearing, the beaks are beautifully smooth.**

This investment in additional animal welfare also quickly pays off. According to calculations, the **extra costs are recouped within two years** and often even faster. This is because you save on feed costs, have healthier and more uniform birds, and – eventually – you will have more fertilized eggs (see research results on page 10).



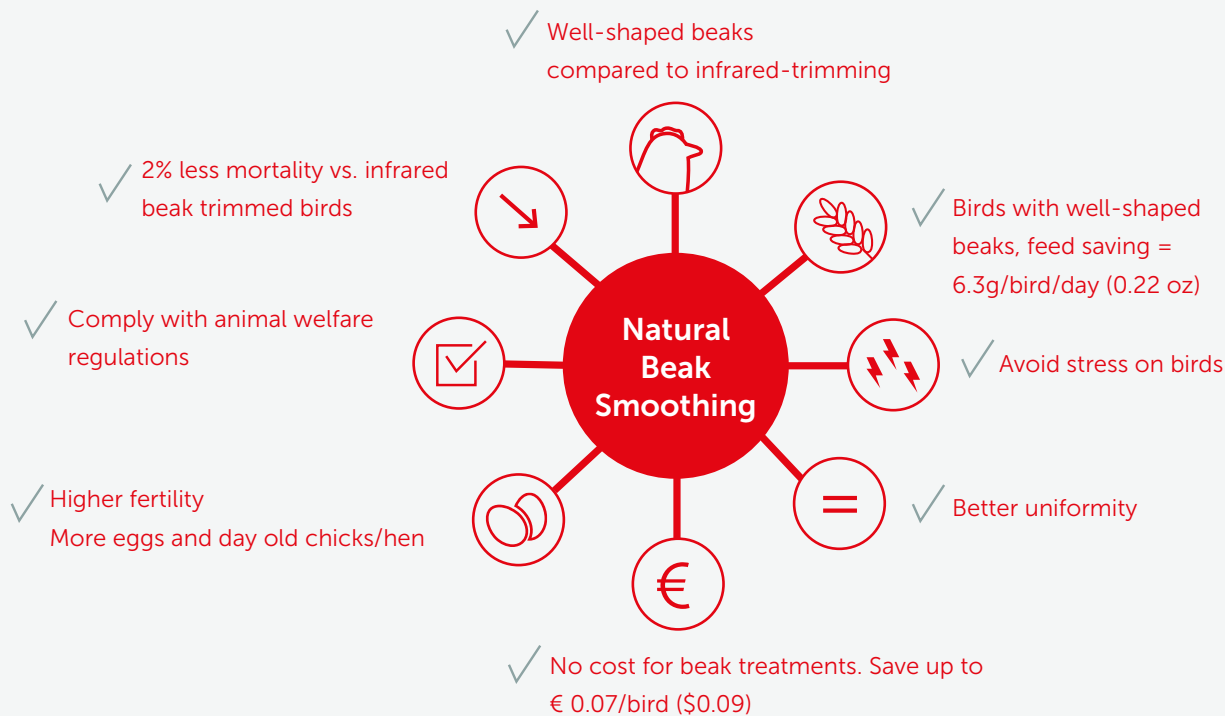


## 1. THE BENEFITS OF NATURAL BEAK SMOOTHING FOR ANIMAL WELFARE:

- / A decline in the risk of infection due to pecking and less stress for the birds.
- / No deterioration in young chicks after beak treatment. The general health of the birds is better and more consistent.
- / It's easier for the birds to eat and drink due to the nicely-formed beaks.
- / The poultry company is making a sustainable choice for the future by implementing an increased level of animal welfare.

## 2. THE ECONOMIC BENEFITS OF NATURAL BEAK SMOOTHING:

- / The mortality rate is at least 2 % lower.
- / Since the beaks are nicely rounded, there is less food wastage. **Our results show that you can save up to 6.3 grams (0.22 oz) of feed per animal per day, compared with IR treated hens. By the end of a flock with 12 000 birds, this figure results in feed savings of up to 34 tonnes (37.5 US t).**
- / Of course, traditional treatments such as mechanical hot-blade debeaking and IR are no longer needed if you opt for Natural Beak Smoothing. These outdated methods are quite labor-intensive and also involve recurrent costs of around €0.07 (\$0.09) per bird\*.
- / A healthier, more uniform group has better fertility rates, which means that more eggs, and ultimately more day-old chicks, are produced per hen.



Three years after this product's launch, the poultry market is in agreement that it is the **perfect alternative to traditional, painful beak treatments.**

\*costs vary per region and technique.

### 3. **Research results** at Couvoir Perrot (FR)

The benefits of Natural Beak Smoothing are clear. But poultry integrations and hatcheries often want to see case studies from other poultry companies that have already made the switch. Roxell and its distributors have realized many successful installations in previous years. **In 2020, we launched a test in collaboration with Couvoir Perrot, a hatchery in France.** The French division of Aviagen monitored the test and were one of the impartial parties assessing the beaks.

There was a test set-up with Natural Beak Smoothing at broiler breeder company Entreprise EARL Chevillard, where we monitored the broiler breeders over 20 rearing weeks. After this period, we monitored them up to week 64. In this chapter, we will compare the results from **the house with IR treatment **A****, **the house with Natural Beak Smoothing **B**** and **the house without treatment **C****. Below, you can see the most important figures and conclusions from this test.



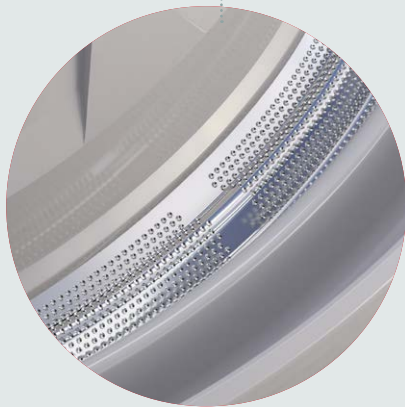
Entreprise EARL Chevillard





Roxell Vitoo™  
feeder pan  
Standard

Roxell Vitoo™ feeder pan with  
Natural Beak Smoothing



Your guide to start using Natural Beak Smoothing

## Test method with Natural Beak Smoothing

- / **5 test partners:** le Couvoir Perrot (hatchery), Entreprise EARL Chevillard (broiler breeder company), Aviagen (breeder), Sodimel (Roxell distributor) and Roxell (Natural Beak Smoothing developer).
- / **Location:** Saint-Malon-sur-Mel, France
- / **Test in 3 houses:**

	<b>HOUSE A</b> WITH IR	<b>HOUSE B</b> WITH NATURAL BEAK SMOOTHING	<b>HOUSE C</b> NO TREATMENT
<b>Type of beak treatment</b>	IR treatment	No beak treatment	No beak treatment
<b>Type of feeding system</b>	Roxell <b>Vitoo™</b> feeder pan <b>Standard</b>	Roxell <b>Vitoo™</b> feeder pan with <b>Natural Beak Smoothing</b>	Roxell <b>Vitoo™</b> feeder pan <b>Standard</b>
<b>Feeding frequency</b>	From day 28: 5/7 principle	From day 10: daily	From day 28: 5/7 principle
<b>Breed of broiler breeders</b>	Ross 308		
<b>No. of day-old chicks</b>	11 760	11 760	11 600



## The results during the rearing period with hens

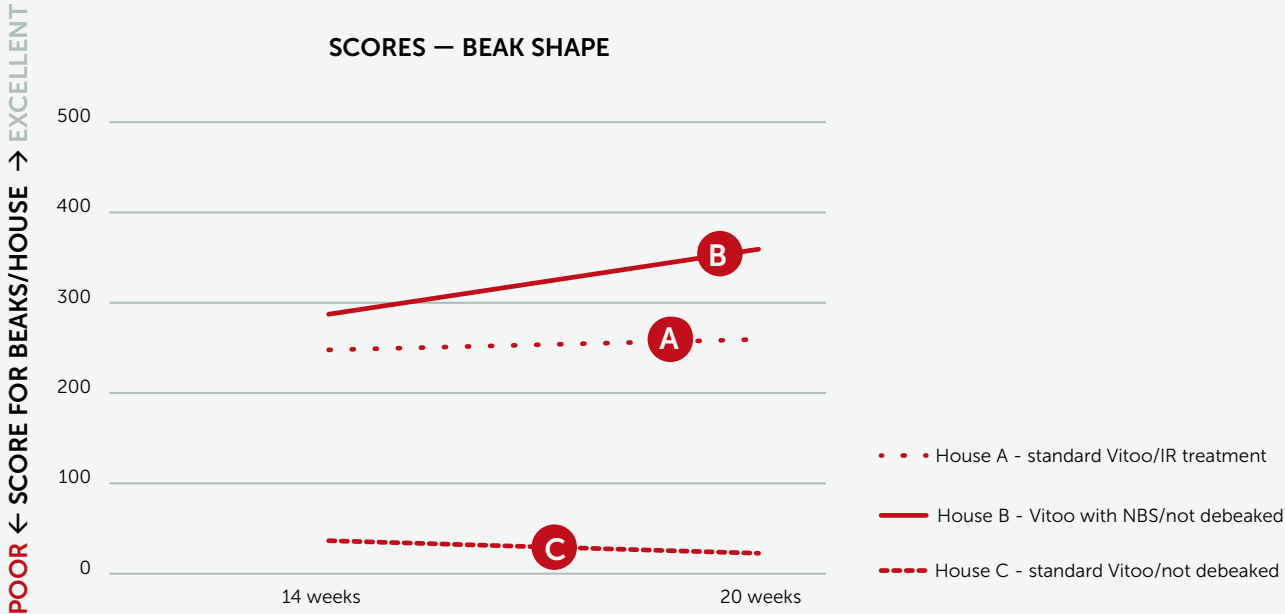
### 1. EVOLUTION OF BEAK SHAPE — OVERBITE AND SHARPNESS

The test partners assessed the beaks of the hens at two points during the rearing period: **week 14** and **week 20**. In the production period, there was one review moment in **week 58** (for results see page 17).

- / Visual checks for two aspects:  
**overbite** and **sharpness** of the beaks
- / Possible score:  
**poor, acceptable** and **excellent**

**Conclusion: only in house B with Natural Beak Smoothing did the scores for beaks significantly improve between week 14 and week 20:**

- / House B – NBS: in week 20 – 92 % were given a score of 'acceptable' or 'excellent' of which 51 % 'excellent'
- / House A – IR: in week 20 – 76 % were given a score of 'acceptable' or 'excellent' of which 27 % 'excellent'
- / House C – with no treatment: in week 20 – most scored 'poor' due to excessive overbites and sharp beaks



## 2. MORTALITY RATE

The difference in mortality rates between the three houses was insignificant in this test due to two reasons:

- / the chicks had diverse backgrounds — up to four different batches per house
- / the grandparent stock did not have identical ages (between 30 and 55 weeks)

**Conclusion: Couvoir Perrot shared that – in earlier tests – skipping the IR treatment resulted in 0.5 % fewer deaths among day-old chicks.**

### 3. FEED SAVINGS

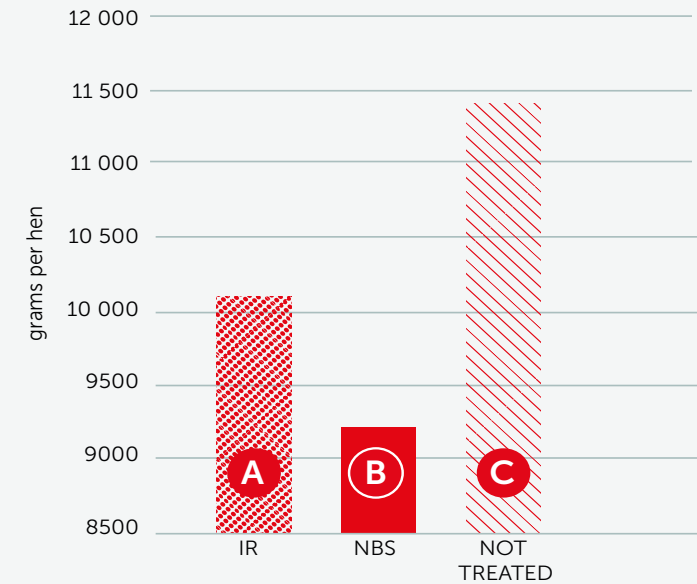
During the test, we monitored the feed consumption per hen, per day in a period of 20 rearing weeks.

	HOUSE <b>A</b> WITH IR	HOUSE <b>B</b> WITH NATURAL BEAK SMOOTHING	HOUSE <b>C</b> NO TREATMENT
<b>Tonnes of feed per rearing house</b>	113 t or 125 US t	102 t or 112 US t	110 t or 121 US t
<b>Total feed consumption during rearing/hen</b>	10 120 g or 357 oz	9233 g or 326 oz	11 438 g or 404 oz incl. extra week

**Conclusion: hens with beautifully smoothed beaks waste less feed. A comparison:**

- / House **B** – NBS: savings of **6.3 g/hen/day (0.22 oz)** compared with House **A** – IR
- / House **B** – NBS: savings of **15.8 g/hen/day (0.56 oz)** compared with House **C** – no treatment
- / House **B** – NBS: **10 170 kg/flock (22 421 lb)** less feed used compared with House **A** – IR or **€3561/flock** (or \$4148) at a feed price of €350/tonne (\$370/US ton)
- / House **C** – no treatment: the hens had to remain one week longer in the rearing house due to uniformity problems and inadequate sexual development

**TOTAL FEED CONSUMPTION AT THE END OF REARING PERIOD**





#### 4. BODY WEIGHT

It bears noting that hens with a low body weight always had a poor scoring beak. Therefore, there is a link between beak irregularities and difficulties with eating and drinking.

**Conclusion: in all three houses, the body weight fell within the usual range at the end of the rearing period. However, it took House C – no treatment, one week longer to complete the rearing period and reach the targeted uniformity and sexual development.**

- / House A – IR: average weight of the hens 2356 grams (83.11 oz) after 20 weeks
- / House B – NBS: average weight of the hens 2418 grams (85.29 oz) after 20 weeks
- / House C – no treatment: average weight of the hens 2321 grams (81.87 oz) after 21 weeks

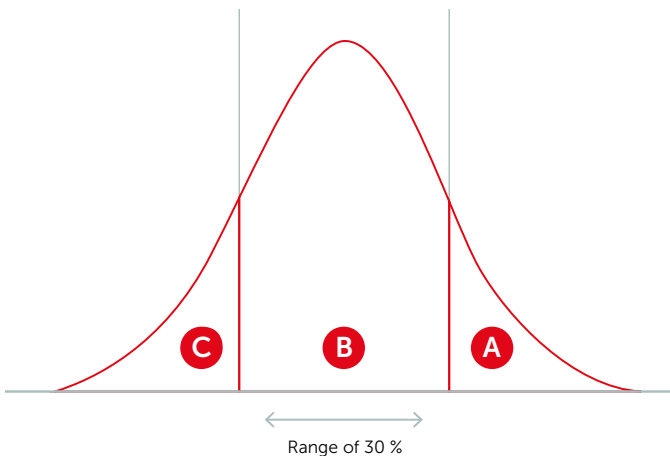


## 5. CONCLUSION: OPTIMAL UNIFORMITY WITH IR OR NATURAL BEAK SMOOTHING?

The ultimate goal of the rearing period was successfully achieved: the house with Natural Beak Smoothing was the most uniform of all three houses after 20 weeks. To reach this result, the hens in the house with Natural Beak Smoothing used the least feed.

In general, this research showed that the beaks remain growing continually:

- / **with Natural Beak Smoothing**, this is less of an issue because the beak is constantly maintained by the file in the bottom pan. It's a gradual process and in the second half of the rearing period the beaks were perfectly smooth. This gave this group of hens a **head start in the production phase**.
- / **with IR treatment**, the scores for the **beaks already began decreasing in the second half of the rearing period**. This resulted in a poorer performance in the production phase compared with the hens with Natural Beak Smoothing.
- / **without treatment** the hens needed an **extra week to get ready to move to the production period**. Pecking up feed is difficult with untreated beaks. After an extra week in the house, the uniformity of this group also fell within the usual range.



Overview of results **with Natural Beak Smoothing** in rearing period:

- / the shape of the beaks scores the best and improves throughout, which is not the case with IR treatment
- / large savings on feed costs
- / savings on recurrent treatment costs
- / this group of hens achieved the best uniformity



# PRODUCTION

## The results during the production period

Every rearing group stayed together and each moved to a separate production house.



### HENS FROM HOUSE WITH IR **A**

### HENS FROM HOUSE WITH NATURAL BEAK SMOOTHING **B**

### HENS FROM HOUSE NO TREATMENT **C**

<b>Beak treatment during rearing</b>	IR treatment	No beak treatment but 'smoothing' throughout the 20-week rearing period	No beak treatment
<b>Type of feeding system in production</b>	Feeder pan with no file texture	Feeder pan with no file texture	Chain feeding system (flat chain)
<b>Location</b>	Production house at contract grower A	Production house at contract grower A	Production house at contract grower B



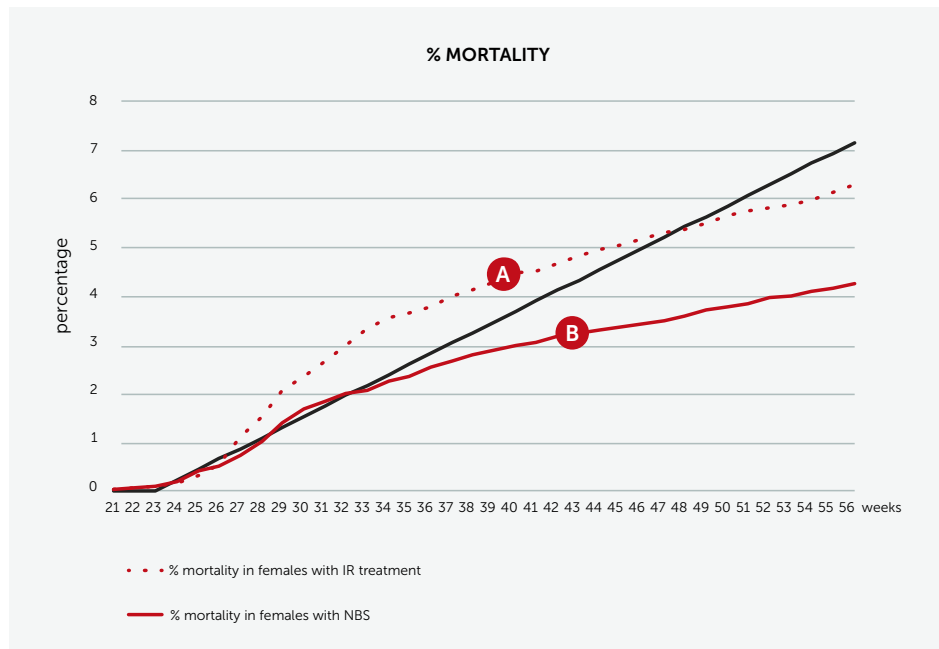
## 1. MORTALITY RATE

In spite of the fact that the males were slightly too mature when introduced to both houses (grower A), this primarily caused problems with hens from House **A** with IR. The males caused stress, which resulted in more feather pecking. The hens from House **A** with IR had sharper beaks, which resulted in increased deaths. This did not affect the mortality rate of hens from house **B** – with Natural Beak Smoothing.

**Conclusion: there is a low mortality rate among hens from house **B** – with Natural Beak Smoothing compared with hens from house A with IR.**

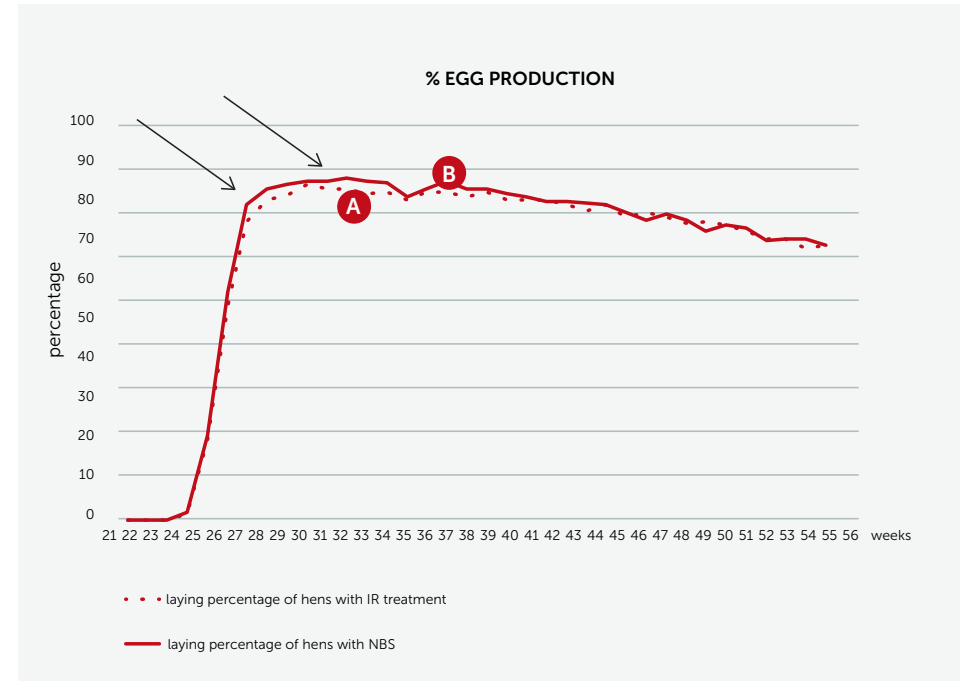
Between week 21 and week 56:

- / Hens from house **B** – NBS: 4.24 % mortality rate
- / Hens from house **A** – IR: 6.28 % mortality rate



Your guide to start using Natural Beak Smoothing

## 2. EGG PRODUCTION



**Conclusion: House **B** – with Natural Beak Smoothing had the best uniformity at the end of the rearing period. This resulted in the hens starting to lay eggs earlier and being more productive in the other weeks. During a 6-week period, the laying percentage is above 85%.**

Between week 21 and week 56:

- / Hens from house **B** – NBS: 87.1% laying percentage  
168.6 eggs per hen
- / Hens from house **A** – IR: 85.5% laying percentage  
164.3 eggs per hen

### 3. FERTILITY AND DAY-OLD CHICKS

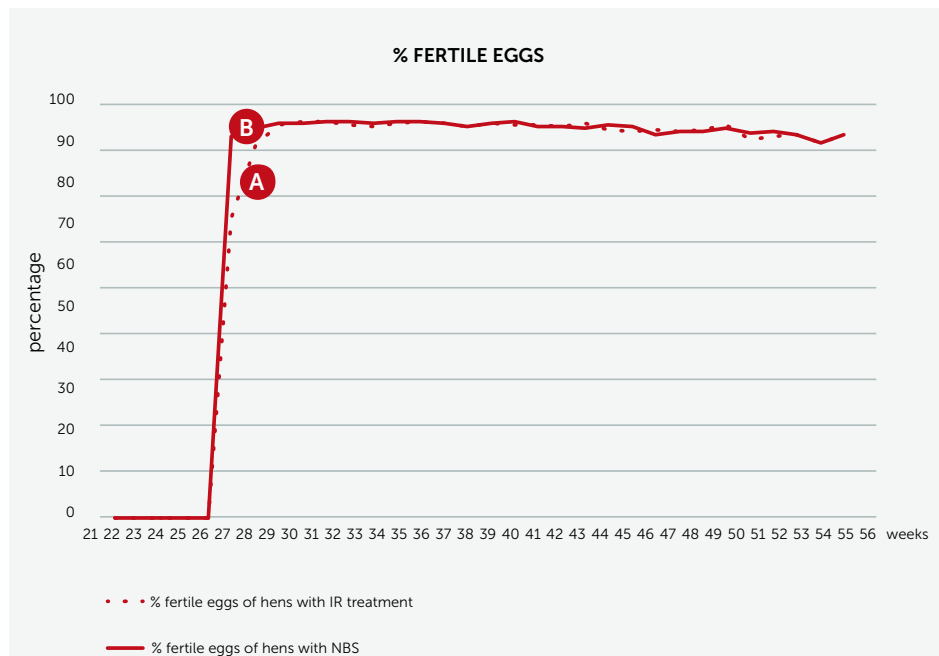
**Conclusion: hens from house B – with Natural Beak Smoothing laid more fertile eggs. At the end of the production period (week 64), a hen from house B has produced 8 extra day-old chicks. In total, for an entire flock that amounts to 78 300 extra day-old chicks.**

**Between week 21 and week 52:**

- / Hens from house B – NBS: 94.86% fertile eggs  
126.1 day-old chicks per hen
- / Hens from house A – IR: 93.80% fertile eggs  
120.14 day-old chicks per hen

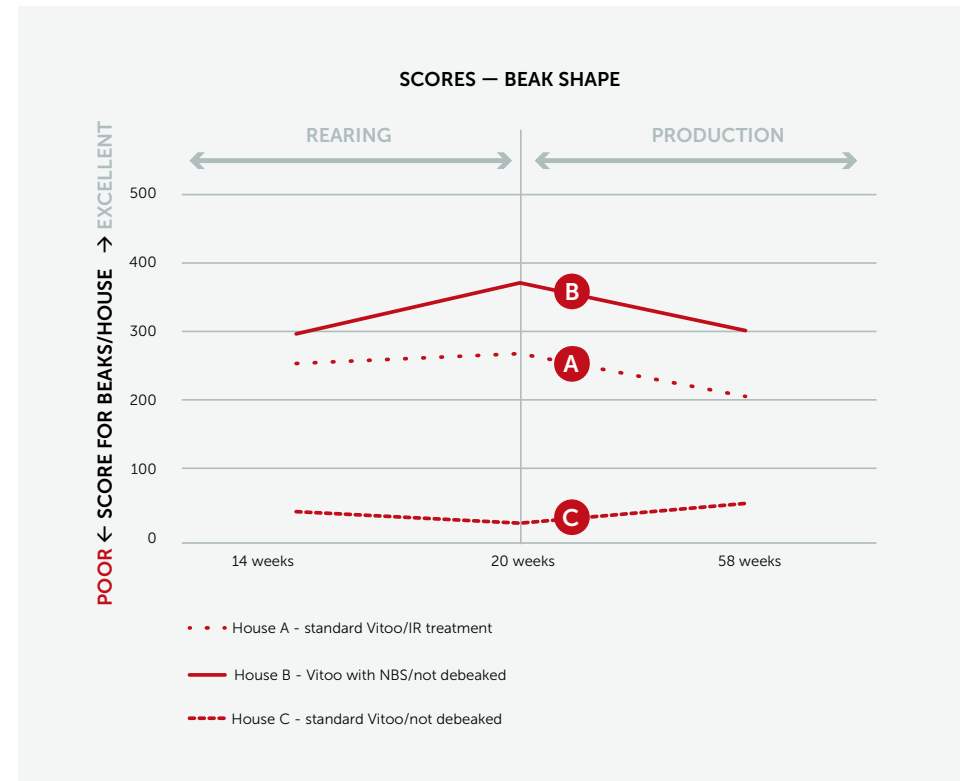
**At week 64:**

- / Hens from house B – NBS: 155.20 day-old chicks per hen
- / Hens from house B – IR: 147.86 day-old chicks per hen



### 4. CONTINUED EVOLUTION OF THE BEAK

In all three production houses, the beaks continued to grow and the tips became sharper, which meant a decline in the beak scores. A feeder pan with Natural Beak Smoothing in production would continue to keep the beak growth under control.



**Conclusion: hens from house B – with Natural Beak Smoothing continue to gain high scores for beak shape in the production phase. The head start they got in the rearing phase with Natural Beak Smoothing continues to benefit them. The beaks of the hens with IR treatment break off more frequently due to the formation of scar tissue. The chain feeding system in house C hardly improved the score for the beaks.**

## BEAKS IN WEEK 57



**A** Hens with  
IR treatment



**B** Hens with Natural Beak  
Smoothing in rearing period



**C** Hens without  
treatment

**Natural Beak Smoothing** is a new, additional factor that helps bring about positive results in the production phase, alongside many other technologies. You gain greater control over the following results:

- / less mortality
- / laying percentage of 80 % is achieved earlier
- / average laying percentage per flock is higher
- / the laying percentage stays above 85 % for 6 weeks
- / more fertile eggs and day-old chicks



## Return on investment after one year and higher returns

### The investment:

Test results show that an investment in a Vitoo pan feeding system with Natural Beak Smoothing is recovered in one year. Just the **savings on feed and debeaking were enough to justify an investment in an animal-friendly beak treatment**. *Three quarters* of the annual savings are the result of feed savings and *one quarter* is due to stopping beak treatments. Feed savings of 6.3 grams/hen/day in the rearing phase seem negligible, however the figure per house on an annual basis is significant: **22 tonnes (24 US t) of feed savings**. These savings made all the difference in the calculation of the return on investment time frame for Natural Beak Smoothing during the test in France.

There is also the fact that the investment in Natural Beak Smoothing is not an annually recurring cost. The effect of the file is guaranteed for at least 10 years, as long as it is used normally and cleaned correctly. During wear monitoring, we see that the sharpness does not deteriorate quickly, which leads us to believe that the file will last even longer.

**Natural Beak Smoothing has more than proved itself after one flock. The research results demonstrated that choosing Natural Beak Smoothing offers many benefits for animal welfare, as well as the bottom line.**

## 4. Testimonials

**Each day 4 500 000 broiler breeders eat from a feeder pan with Natural Beak Smoothing. What do poultry farmers say about it?**

### **Turkmenistan: Nurly Meydan**

*"The males are given specific feed in a special pan with high feed windows = the Boozster™ feeder pan with Natural Beak Smoothing. When the males eat, their beaks rub against the rough texture of the pan bottom, which controls the growth of their beaks in a natural way. As a result, they develop well-formed beaks."*

### **India: Life Line Feeds**

*"In recent years, Life Line Feeds has made strategic investments in solutions that will reduce stress in the birds. Roxell's Natural Beak Smoothing fits perfectly within this philosophy."*

### **The Netherlands: Jan Hoving**

*"Chain feeder systems do not offer a replacement for banned beak treatments. Roxell's pan feeder systems for broiler breeders, on the other hand, do have an answer to this problem. If you want to eliminate painful treatments, the choice is obvious."*

### **China: Tieling Yonghong Animal Husbandry Co. Ltd**

*"The groups of males that eat from the feeder pans with Natural Beak Smoothing in the rearing phase are always very uniform. I'd estimate that the uniformity has improved by +5 % and the mortality rate is on average 2 % lower than before. These are encouraging statistics that boost the profitability of this poultry site."*

### **Belgium: Dirk Mertens**

*"I notice there is less mortality among our chicks, because they don't suffer a relapse following beak treatment. They have less stress and can just continue eating during the first days. We also notice a greater uniformity among the chicks. All these things eventually lead to a better end result."*



## 5. **Conclusion** **sustainable, animal friendly and economical**

Choosing a new strategy for beak treatments is one of the prerequisites for being able to call your company 'sustainable' and 'animal friendly'. These are choices that the public is demanding ever more fervently from its food producers. Yes, investments are required, however, they don't always have to negatively impact your business models.

### **Sustainable**

In the list of sustainable solutions, Natural Beak Smoothing scores high. The sustainability is inherent in the product. The strength and evolution of the sharpness of the file has been extensively tested in the design phase. Roxell continues to measure the wear of the file at its pioneer customers on an annual basis. In addition, Roxell believes that **the sharpness of the metal file is guaranteed for at least 10 years, and probably longer**, as long as it is used normally and cleaned correctly. Thanks to this strong, durable, and efficient solution, you avoid wasting valuable raw materials, energy, and investments.

### **Animal friendly**

If you want to be sustainable, you also have to have a high standard of animal welfare. The use of IR and hot-blade debeaking is not good enough anymore. In recent years, we have seen awareness of animal welfare increase across the world, among all players in the sector. This is because healthy, stress-free animals grow better, and farmers enjoy a better return on their work. Many breeders have therefore set up test houses with Natural Beak Smoothing. These tests have been unanimously positive thus far. The poultry market is in agreement that it is the perfect alternative to traditional, painful beak treatment.

### **Economical**

Furthermore, this solution is an affordable alternative for poultry farmers. The calculation of what you will save on feed and debeaking treatments is surely enough to justify the investment in an animal-friendly beak treatment. If you add in the extra gains, the returns are even higher. The mortality rate drops and other success factors improve: better fertility, more eggs, more day-old chicks, and so on. All this just by controlling beak growth in an animal-friendly manner.

For more information:  
[roxell.com/natural-beak-smoothing](https://roxell.com/natural-beak-smoothing)



## About Roxell

Roxell, with its head office in Maldegem, Belgium, is a worldwide market leader in automated feed, drink, nesting, heating and ventilation systems for poultry and pig farms. Our success and our reputation are based on our diverse product innovations, a sound investment policy and the talent and dedication of our 275 staff and more than 165 distributors worldwide.

Roxell BV is a subsidiary of CTB, Inc. CTB is a global leader in the development, manufacture and distribution of systems and solutions for the poultry, pig, egg and grain sectors. You can find more information at [www.roxell.com](http://www.roxell.com).

[WWW.ROXELL.COM](http://WWW.ROXELL.COM)

**For information about Natural Beak Smoothing contact Roxell or contact your local Roxell-distributors. Go to [www.roxell.com](http://www.roxell.com) and click 'Find distributor' to find a distributor near you.**

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