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Beak Trimming – A Welfare Concern???

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ARTICLE ID: 080

Introduction

Cutting of approximately 1/4th to 1/3rd of upper beak or both upper and lower beak of birds is invariably known as beak trimming (partial amputation). It is mostly done in egg producing birds (layers) and in turkeys to decrease injuries caused by cannibalism, bullying, feather and vent pecking while deciding the flock order or pecking order birds peck in their vicinity and among themselves. However, this becomes a problem in commercial poultry farms and causes mortality up to 25-30%. Nevertheless, beak does regrow and have functional receptors in it.

Past of Beak Trimming

Earlier, when farmers raised chicken on wire floor in the indoor system, less space available and boredom causes birds to impede their own natural behaviours such as scratching, wing spanning, dust bathing and pickup any vice as pecking each other and causing severe wounds and even mortality. As a remedy, cutting of beaks was opted. It is known that, beak trimming was developed at Ohio Experimental Station in 1930s. Originally it involved temporary cutting of 5-6 mm beak with the help of sharp knife. T.E. Wolfe used a gas torch to cut upper beak by burning, of his own hens in late 1930s at San Diego, afterwards, a chisel like structure was made by soldering

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iron to cut and cauterize beak simultaneously came into light. Term "debeaker" was coined in 1942 and got registered in 1943. Lyon electric company first created out a heated knife-like device to act as a debeaker.

Why it is Needed ????

Wounded vent, raw injury, fallen off feathers, broken skin and blood-stained birds, additionally overcrowding, bad litter management, poor ventilation, no or less overhang, parasites etc. are most common findings in cannibalism-stricken farm. Larger commercial poultry farms are more prone as it is learned behaviour so more birds and more chances of spreading it. It is reported from all types of poultry housing system more or less.

Generally, chickens do wing flapping, scratching floor and dust bathing but in the complex housing system, birds are unable to perform any such activity and it leads to stress directed to pecking, cannibalism. Deficiency or imbalance of the many nutrients in the poultry ration, insufficient salt, fibres, feeding and watering space contribute to this vice and need of debeaking. Light intensity more or equal to 5 lux, is reported to cause pecking in untrimmed laying flocks.

Advantages of Beak Trimming

There are reports suggesting that in due course of time beak trimmed laying flocks have lower mortality rate, eat and waste less food and have improved feed conversion ratio. Better plumage, have better insulation and homeostasis. It also reduces the hysteria problems in the poultry birds. It decreases aggressiveness among birds and specially in laying flock. Trimmed laying birds were more fore-fronted than untrimmed.

Procedure and Mode of Work/Action

Debeaker cut and cauterize simultaneously so called as 'cut-caut' debeaker. The upper beak is inserted between red hot blade and the platform, the blade is brought down and it cut and caut the beak. The index finger is placed between beaks to hold tongue. Usually, the lower beak is only trimmed and cauterized. Various hypothesis to explain the working of this method are explained three theories to explain is as:

1. Acute effect is to just shorten the beak, making pecking problematic.
2. Pain resulting from the cut reduces the pecking attempts by the bird, causes learned inhibition of pecking.

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3. Since damaged beak have no sensory feedback and thus perception and reward are affected so pecking get reduced.

How Much to Cut and Age of Beak Trimming?

In layers, the top 1/3-1/2 of beak and in broilers top 1/3, lower beak is to be cut in layers only ¼ and not in broilers. Most common age of beak trimming is in day old chick, 5-10 days, 4-6 and 8-12 weeks for re-trimming of beak, by the day old trimming the need to retrim reduces.

Different Beak Trimming Methods

- **Hot blade and gas-trim method** - A heated blade is used here with temperature of 650-750^{O}C (dull red color of blade) or 850-950^{O} C (cherry red color). Some tissue damage near the cut-up parts is reported in the birds. Retrimming is needed. In gas trim method, a hot plate and foot lever is used. Good for the small number of birds and is more time consuming.
- **Robotic hand and cold blade method** – Usually chicks are holded by the cups and then positioned them properly to cut the beak by a robotic hand. Chances of the excessive or very light beak trimming is always present. *"Robot AG4500"* in France performs beak trimming and vaccination simultaneously. In cold blade method, a cut of 1/16 to 1/8 inch is made on one side of beak, tearing of beak at about 1/6-inch posterior to tip of beak is done by plain side of chilled knife.
- **Chemical beak and bio-beak trimming** – A chemical known as capsaicin extracted from hot peppers to produce an acute burning sensation in birds is used. It reduces regrowth of beak and hence need for re-trimming. Bird eyes and operators' bare skin must be protected while using it. In bio-beak trimming method, an electric arc of 1500 volt AC is given for 0.25 sec, will burn a small hole in the upper beak at a point just beyond the horny projection so that the tip of beak will die, can be done only in day

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old chicks. Rate of trimming is very fast @ 2000 birds/hr. First bio-beaker was developed by Sterwin laboratories, Delaware, U.S.A.

- **Infrared and laser beak trimming** - In day old chick high intensity, infrared source, laser beam is used to cut beak. Birds are held by head and suspended during treatment in proper position for about 1.5 seconds, corneum layer of beak is penetrated by the laser beam. Superior feather conditions and reduced aggressiveness is reported in this method, it is preferred method recognised by British farm animal welfare council, as there are no open wounds in it.
- **Freeze drying and electric soldering iron methods** – Liquid Nitrogen is used. Time consuming and costly. A disc is made up of the soldering iron and then tapered when heated, tip reaches the temp. up-to 327^{O}C. however this method is very painful to the bird and damage up-to epidermis and distal parts of the nares.

Main Welfare Issue Relating to Beak Trimming

Beak trimming always attracts a lot of debate between the poultry scientists regarding the welfare of the birds. Beak in birds is used for feed particle prehension, environmental exploration, preening and social defence. So, beak trimming leads to reduction in the feed intake pecking efficiency, preferences, drinking ability, loss of temperature, touch and nociception and causes chronic pain. It sometimes leads to development of the neuromas.

- **Pain** – During trimming birds struggles and make sounds due to very high temp. and the traction of the blade. The birds developed neuromas if trimmed at 5 weeks of age, adjacent to the scar creates difficulty in the regenerating and innervating nerve fibre. Trimmed birds spend larger time standing passively, for them feeding is less rewarding, spent less time in drinking, preening and cage pecking, it is associated with or because of the pain.
- **Behaviour changes** - Birds gets docile in nature, spend more time in resting and standing than feeding. The pullets also show more guarding behaviour as tucking the beak under wings (dysaesthesia) due to pain. More behavioural changes as feeding, drinking, environmental pecking, preening, head shaking and time spent of couching and standing inactively. Positive behavioural changes include decrease in the cannibalistic activity, beak affiliated pecking and the fearfulness because of the beak trimming.

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Alternatives to the Beak Trimming

- **Genetic Selection** – There exist large differences in feather pecking and the mortality in strains, depicts potential for strains that require less or no beak trimming at all. Existence of the genetic markers for welfare traits will help in the marker assisted selection in the future. Selection for the low mortality reduce the propensity of the bird to develop feather pecking and cannibalism.
- **Nutrition and hormones**– Low levels of fibre, salt, calcium, magnesium, arginine, zinc, protein, sulphur containing amino acid as methionine &cysteine, tryptophan, thiamine maximizes incidences of cannibalism. So, give the diet of low density but high in fibre and other given nutrients. In growing layers, implanting gonadal hormones reduces pecking during 18-21 weeks of age, this result is may be because of testosterone
- **Spectacles, contact lenses and blind chickens** – Spectacles are anti-pecking devices made of flexible PVC fitted on the nares of birds. It allowed them to see downward and in sides, not ahead so reduces pecking and also break the social hierarchy. They are costly and useful mainly in the pullets. Red color contact lenses are used in 1960s but causes the eye infection, irritation and other behavioural problems. However, by using them egg production gets lowered and mortality increases. Genetically blind chicken by reducing the rods and cones in the retina remain fully feathered, eat less and give more eggs.
- **Enrichment Devices** – Newly designed environmentally rich cages are present with more perch space, more standing and drinking space, better litter quality and management, but this is needed to introduce at very early stages of life.
- **Light intensity** – Chickens have the color vision so different colors and light level affects chicken behaviour. Red light decreases the cannibalistic activity because difficulty in differentiation of red color of blood vessels and red color light. Recently, very dim white light is used to prevent the feather pecking and cannibalistic activity.

Summary

Currently, it is considered as an important management practise in commercial poultry farms. Regarding, welfare of bird this practise should be prohibited as it causes pain and unruly behaviour but welfare which is subjugated by the hazards of cannibalism and

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feather pecking must also be kept in mind. Here benefit is more than cost. Use of different alternatives to debeaking are present now a day that would more address the rationale behind the beak trimming and in future may provide free management in any well administered commercial poultry farm.