100% NATURAL

Made with all natural ingredients

Salixivet

Inspired by Nature. Powered by science.

#1

Natural alternative to pain medication

Relieves Pain

Increases Intake

Improves FCR

TRUEVET

VALUE THROUGH INNOVATION

truevet.in

PAIN

EXPERT OPINION

“Not just an Animal Welfare issue but can negatively impact Productivity”

Key Takeaways

Pain in animals is an aversive sensory experience caused by actual or potential injury that elicits protective motor and vegetative reactions, results in learned avoidance, and may modify species specific behavior, including social behavior(*Zimmerman*).

When pronounced and/or long lasting, the pain-induced behavioral and physiological changes can decrease production performance.

Modern husbandry practices, & Selection pressure for production traits increase predisposition of farm animals & birds to pain & related conditions.

Most of the neural elements and biologic consequences (physiologic, neuroendocrine, behavioral) of pain are the same among all mammalian species.

EXPERT OPINION

> **“One basic tenant of animal welfare is to maintain animals free from pain, injury or disease. First step towards reducing pain & suffering in animals is timely detection and evaluation of the intensity of pain in animals ”**

As animals cannot directly communicate their feelings, experts identify sensitive and specific indicators for this purpose. Animal healthcare workers & researchers have developed many relevant indicators to assess pain in several farm species. The term pain is used for mammals, birds and fish, even though the abilities of the various species to experience the emotional component of pain may be different.

PAIN
IN POULTRY

The behavioral and physiological evidence of possible pain experienced by layer and broiler birds in modern husbandry conditions from the acute pain experienced by chicks following beak trimming to the pain of shackling on the killing line prior to slaughter Is well documented in scientific literature.

The presence of nociceptors which signal actual or potential tissue damage, the behavioural and physiological changes resulting from nociceptive stimulation together with the physiological and behavioural changes following trauma would amply satisfy Zimmermann's definition of pain applied to poultry - *Gentle, 1992*.

TYPES OF PAIN

1. ACUTE
2. CHRONIC

Key Takeaways

"**Acute Pain** lasts for second to days and follows nociceptive stimulation or minor trauma and goes off following healing. Chronic pain however, lasts for weeks or even years and is seen in chronic disease states or after major trauma. As part of a framework for detecting acutely painful experiences it is important to determine firstly that the animal has the necessary sensory receptors to detect the actual or potential injury and secondly that activation of these nociceptors results in both behavioural and autonomic cardiovascular changes"

"**Chronic pain** on the other hand, is not simply a continuation of acute pain; with prolonged pain. New factors emerge following pathological changes in the peripheral nervous system and physiological changes in both the spinal cord and the brain. The behavioural changes seen in chronic pain in both humans and animals are often more global in nature with not only guarding of the injured structure but also reductions in a variety of behaviour patterns including overall activity, exploratory and grooming behaviour"

Poultry throughout their lives sometimes experience a variety of acute or chronic painful conditions which are either inflicted on the animal as a result of current husbandry practices (e.g. beak trimming, pre-slaughter shackling) or occur as a result of trauma (e.g. bone breakage resulting from osteoporosis in the laying hen) or disease (e.g. orthopaedic disease in broilers). Animal Health workers should aim to identify potentially painful conditions in poultry and use the current state of knowledge regarding each issue to allow a scientific evaluation of the resulting welfare compromises.

CAUSES OF PAIN IN POULTRY

1

BEAK TRIMMING

It is an effective method of minimising feather pecking and cannibalism in layer flocks, but the procedure gives rise to welfare concerns due to its potential to cause short and/or long term pain and loss of function. Behavioral consequences as a result of pain following beak trimming might result in reduced feed intake ,reduced physical movements & beak guarding.

2

FEATHER REMOVAL

Feathers are removed for variety of purposes either manually or with machines and in both cases birds experience pain.

3

SHACKLING

Shackling of commercial poultry involves the insertion of each leg into parallel metal slots and holding the bird inverted for a period of time before stunning and slaughter, & is assumed to be a very painful procedure.

4

FOOTPAD DERMATITIS

It is relatively common in Broiler chicken & results in acute pain which has significant commercial implications in terms of reduced feed intake & low FCR.

5

ENVIRONMENTAL POLLUTION

In modern intensive Poultry production systems , levels of ammonia or Carbon dioxide can rise which might give rise to pain on account of presence of nasal and buccal trigeminal polymodal nociceptors.

6

SKELETAL DISORDERS

Skeletal disorder have been prevalent in the poultry industry for many years (Thorp, 1994) and selection pressure for production traits in modern lines of poultry has placed increasing demands on skeletal integrity. In laying hens, the major problem is bone breakage usually resulting from osteoporosis (Webster, 2004; Fleming et al., 2006). In broilers there has been selection for rapid growth rate leading to pathologies in the growth plate and progressive degeneration of articular cartilage results in osteoarthosis and lameness.

Skeletal disorders are often cause of severe pain , whch translates directly in to losses and pose welfare issues as well.

PAIN IN PIGS

In livestock production, pigs experience pain caused by management procedures, e.g., castration and tail docking, injuries from fighting or poor housing conditions, “management diseases” like mastitis or streptococcal meningitis, and at parturition.

CAUSES OF PAIN IN PIGS

1 MANAGEMENT PROCEDURES

Managemental practices like tail docking, teeth resection, castration, ear tagging, or notching.

2 LAMENESS

Locomotor pain in pigs is indicated by lameness, by carrying a foot, favoring a leg, or being unable to get up and move around. Lameness is an important source of pain in pigs.

3 PARTURITION

Farrowing is a painful process .Difficult farrowing (dystocia) is associated with severe pain resulting from prolonged farrowing or assisted extraction.

4 DISEASES

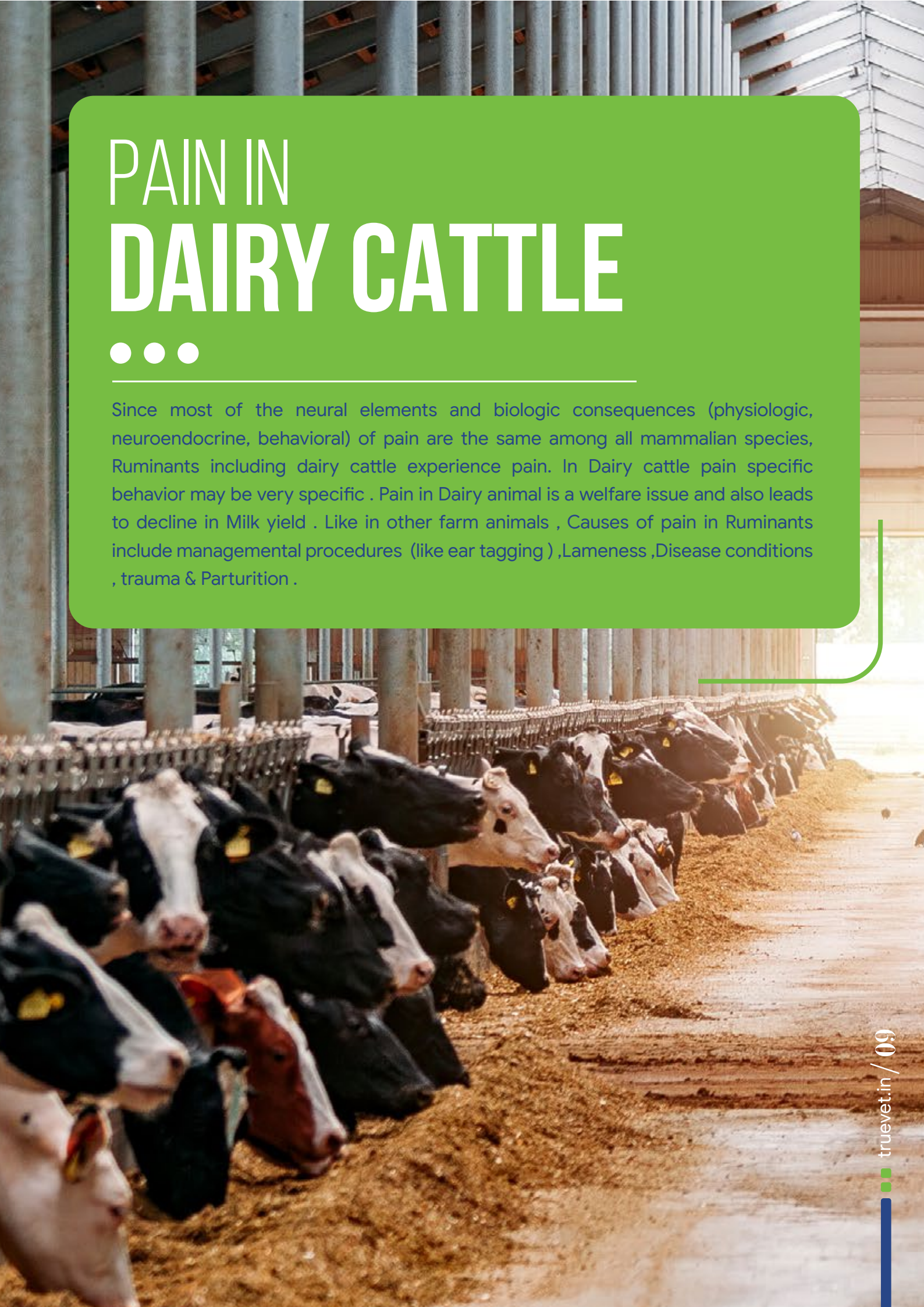
In many diseases conditions Pigs experience varying degrees of pain e.g mastitis.

5 BIOMEDICAL RESEARCH

Biomedical research can be a source of significant pain & discomfort to animals .Animals are often exposed to painful procedures.

PAIN IN DAIRY CATTLE

Since most of the neural elements and biologic consequences (physiologic, neuroendocrine, behavioral) of pain are the same among all mammalian species, Ruminants including dairy cattle experience pain. In Dairy cattle pain specific behavior may be very specific . Pain in Dairy animal is a welfare issue and also leads to decline in Milk yield . Like in other farm animals , Causes of pain in Ruminants include managemental procedures (like ear tagging) ,Lameness ,Disease conditions , trauma & Parturition .



CURRENT APPROACHES
TO PAIN MANAGEMENT IN FARM ANIMALS & POULTRY

Following types of analgesics are usually used in Farm animals:

- Opoids like Butorphonol
- NSAIDs Like Meloxicam
- Corticosteroids like dexamethasone
- Local Anesthetics like Lidocaine

In Avian patients, Usually Analgesia is provided as per mammalian patients

PROBLEMS WITH
CURRENT APPROACH

1 DANGEROUS SIDE EFFFECTS

Analgesics usage poses the risk of deleterious side effects in animal & avain patients.
There is a huge spectrum of adverse reactions to analgesics , ranging from clinically common gastrointestinal problems to rare ones such as aseptic meningitis. Some of the more common adverse reactions to NSAIDs are described as follows:

SYSTEM AFFECTED	ADVERSE REACTION
Gastrointestinal	Gastroesophageal reflex Erosions Peptic ulcers Gastrointestinal hemorrhage Small and large bowel ulceration
Hematopoietic	Impaired blood clotting Impaired platelet activity Blood dyscrasias Bone marrow dyscrasias
Renal	Renal tubular nephritis Renal papillary necrosis Acute renal failure
Others	Hepatotoxicity Aseptic meningitis Diarrhea CNS depression

2 IMMUNE SUPPRESSION

Some analgesics lead to immune-suppression thus predisposing birds & animals to many infectious diseases.

3 FOOD SAFETY

Many analgesics show residual effect. Analgesic residues in food of animal origin like Milk , Meat & eggs pose a serious food safety challenge.

4 ENVIRONEMNTAL IMPACT

Some analgesic residues are known to damage key ecological species which has the potential to disrupt ecological balance. Ecological catastrophe involving complete devastation of resident Gyps vulture populations across the Asian subcontinent as a result of use of diclofenac in animals is a case in the point.

5 INCREASED COST OF PRODUCTION

There are increased costs linked with analgesia, which may negatively impact farm incomes.

OUR SOLUTION

FUNCTIONAL ,SAFE , SUSTAINABLE

Our Patent-pending nature inspired technology is a novel alternative to synthetic analgesics in Food Animals.

PROVEN EFFICACY

Clinically Proven analgesic and anti-inflammatory effect

ALL NATURAL

Made from all natural ingredients.

AFFORDABLE

Rightly priced to ensure higher cost benifit ratio.

100% SAFE

Completely safe for animal, humans and the environment.

OVERVIEW

Man has been using medicinal plants for the treatment of various ailments for thousands of years. More than 4000 formulations in the current pharmacopeias have been derived from the plant sources based on the strong ethnobotanical evidence. Medical plants have traditionally been used for managing various disease conditions in animals, & it's history is as old as the history of mankind itself.With the rapid advancement in drug discovery in last 50 years, hundreds of Synthetic compounds were introduced for the treatment of various ailments in animals. Widespread use of synthetic medicaments in the livestock sector specially in last three decades , if one the one hand has improved productivity & animal wellbeing but on the other hand it has led to a precarious situation. We now face challenges like food safety linked with residual effect of synthetic drugs ,drug resistance , side effect of drugs, and drug impact on the environment. Need for safer alternatives to synthetic drugs in livestock sector is increasingly being felt. Besides other alternatives , Plant origin essential oils /extracts & Bioactive fractions have found much relevance .

Pain & inflammatory conditions are seen in a number of disease & Traumatic situations in animals. With the advent of synthetic analgesic compounds, no doubt management of pain & inflammation in animals have become easier& efficient, nevertheless serious questions have been raised on the residual impact, Food Safety, Side effects, & environmental Impact of synthetic analgesic compounds. These questions assume more significance when we consider intensive livestock production systems which mainly focus on producing food for a growing human population. There is a dire need for functional, safer & sustainable alternatives to synthetic analgesic compounds particularly in food animals.

Salixivet, developed & marketed by Truevet Inc is a synergistic combination of plant origin bioactive fractions with marked antinociceptive effects. It is a sustainable alternative to synthetic analgesics.

BACKED BY SCIENCE

EXPERT OPINION

"PROVEN SAFETY AND EFFICACY"

OVERVIEW OF LABORATORY STUDIES*

A number of studies have been carried out to evaluate the Efficacy of Salixivet in alleviating pain. The antinociceptive activity of the Salixivet has been investigated using experimental models that employed chemical- or thermal-induced nociception, which at the same time were used to determine the effectiveness of Salixivet on inflammatory-mediated nociception (abdominal writhing test), non-inflammatory-mediated nociception (hot plate test and tail flick test) or both types of nociception (the formalin-induced paw licking test) and provides some evidence on the mechanism implicated in this effect. Salixivet has been evaluated for both central (opioid) and peripheral nonsteroidal anti-inflammatory drug (NSAID) analgesic properties.

The analgesic action presented by Salixivet involves supraspinal as well as spinal components as demonstrated in several lab level controlled studies. The results of such studies suggest that Salixivet has a central analgesic effect, as evidenced by the prolonged delay in response when mice were subjected to a nociceptive stimulus in the tail flick test and also by the increase in the reaction time of the mice in the hot plate test.

The peripheral analgesic effect has been tested by acetic acid induced Writhing in mice. The associated nociceptive response is believed to involve the release of endogenous substances like, bradykinin and prostanoids among others that stimulate the nociceptive endings.

*Detailed report available on request

The formalin-induced paw licking test has been carried out to further strengthen the evidence of the antinociceptive activity of the Salixivet seen in both the abdominal writhing and the hot plate and tail flick tests. The formalin test is considered as a valid and reliable model of persistent nociception and involves two distinct phases, a neurogenic pain that corresponds to the early phase, followed by an inflammatory pain that is accompanied by the release of inflammatory mediators designated as the late phase. The first phase of pain (lasting the first 5 min) corresponding to the acute neurogenic pain, is attributed to direct activation of nociceptors and primary afferent fibers by formalin causing the release of bradykinin and tachykinins and the activation of the transient receptor potential vanilloid 1 (TRPV1) channel. This phase is inhibited by opioid analgesics. The second phase (lasting from 15 to 30 min after injection of formalin) is due to an inflammatory reaction caused by tissue injury leading to the release of histamine, serotonin, prostaglandin and excitatory amino acids. This late phase is inhibited by NSAIDs and opioid analgesics. Salixivet at 100 and 300 mg/kg significantly decreased the paw licking time in both the phases of formalin test. A central action has been suggested for Salixivet. Based on results of many studies, Salixivet possesses antinociceptive activity against chemically and thermally induced nociception, and against both inflammation and non-inflammation-mediated nociception.

The pharmacologic effect of Salixivet has been evaluated in a model of mechanical hypernociception induced by important flogistic agents such as carrageenan. Our study demonstrated the effect of Salixivet in the mechanical hypernociception induced by intradermal injection of carrageenan in rats. Carrageenan is an inflammatory agent that is largely used as a pharmacological tool for investigating inflammatory hyperalgesia in rats and mice. When injected intradermally on the plantar surface of animal's hind paw, it induces an inflammatory process associated with hyperalgesia. Tissue injury originating after the injection of carrageenan involves the release of different chemical mediators such as PGE2, mast cells products histamine and serotonin, neuropeptides and cytokines among others. Results suggest that Salixivet may be interfering with different pathways involved in the inflammatory pain signaling*.

Numerous studies have demonstrated the antinociceptive activity of Salixivet at both peripheral and central levels**.

**Unpublished data. Report No. 2231 - analgesic property of Salixivet: J.RefAA2BC*

***Unpublished data. Report No. 2232 A*

TRIED & TESTED

FIELD TRIAL STUDIES ON **POULTRY BROILERS**

A NUMBER OF FIELD TRIALS HAVE BEEN CONDUCTED TO DETERMINE ANALGESIC ACTIVITY OF SALIXIVET, RESULTS OF ONE SUCH TRIAL ARE BRIEFLY DESCRIBED BELOW.

The effects of Salixivet(Novel Phytogenic alternative to NSAIDs)& Non-Steroidal Anti-Inflammatory Drugs (NSAID)-Meloxicam were determined in 1000 broiler chickens on the manner and speed of broiler chickens in different Gate score groups. Meloxicam &Salixivet(Novel alternative to synthetic Analgesics)- Were provided at the recommended dose rate of 4 & 4.5 mg/kg to birds in test groups orally. 1000 birds were evaluated by the GS test, 74 were selected for walking speed analyses. Walking speed analyses, both with and without NSAID/Salixivet were performed. Other factors like General condition, joint inflammation reduction and Mortality were also evaluated. Both Salixivet& Meloxicam favorably improved both walking speed and Manner in Birds with GS score 1 & 2 (with clinical signs of lameness) thereby clearly indicating that salixivet has analgesic& anti-inflammatory properties comparable to NSAID-Meloxicam. There were no mortalities associated with Salixivet or Meloxicam in this study. Salixivet improved overall general condition and feed intake, whereas no such effect was observed in Meloxicam treated goups. Results of the current study revealed that the salixivet has significant analgesic & anti-inflammatory properties and additionally improves general condition and feed uptake in commercial broilers.

TRIAL RESULT HIGHLIGHTS

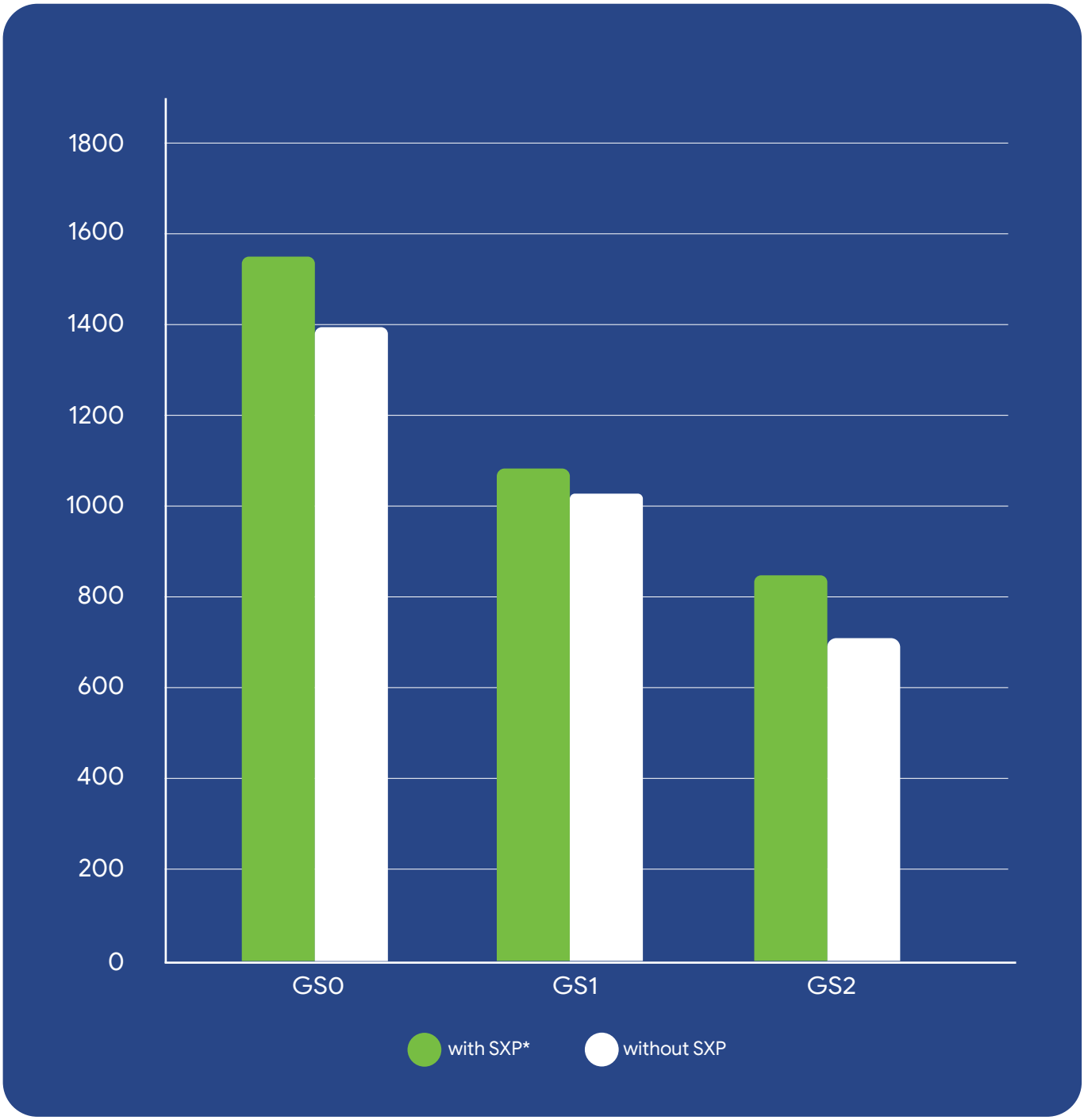
GAIT SCORE ASSESMENT*

Gait Score** (GS)	Gait Score Frequency (%)	Body Weight(g)	Breast Weight (g)	Breast Yield (%)
0	88.03	2820	820	29.1
1	8.88	2990	923	30.9
2	3.09	2088	625	30.0

*Details available on request
**GS0:No obvious signs of problems
GS1:obvious signs
GS2:Severe signs

SPEED OF BROILER CHICKEN

WITH & WITHOUT APPLICATION OF SALIXIVET IN FEED



*SXP-Salixivet

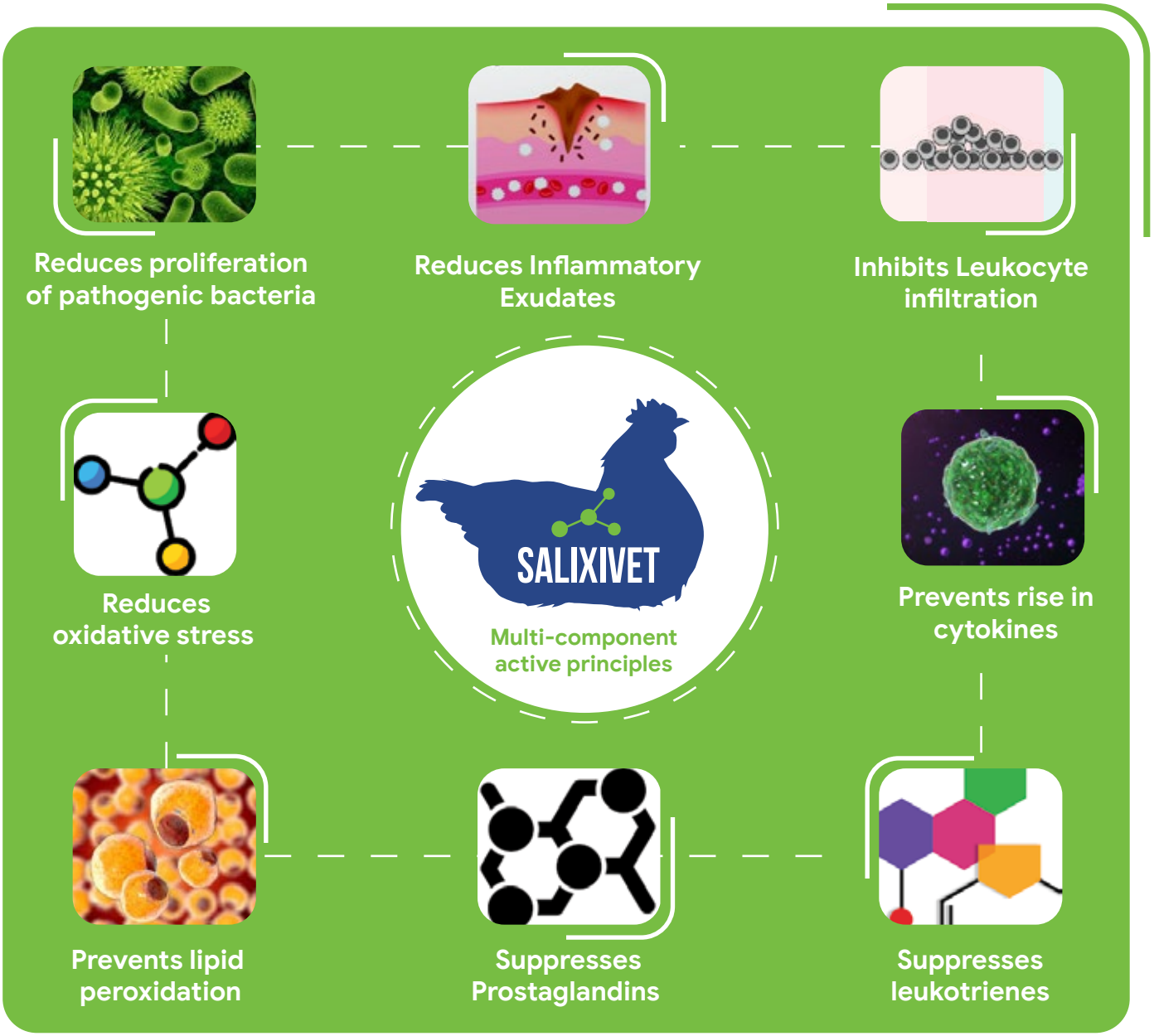
DISTRIBUTION OF SPEED (CM/S) AND PERCENTAGE OF TIME FOR EACH CATEGORY OF BROILER CHICKENS, THE FIRST AND THE SECOND HALF OF THE COURSE

Course	Birds with no analgesics	Birds with NSAIDs	Birds with Salixivet
0-50 cm	24 cm/s (46.6%)	19 cm/s(59.6%)	17 cm/s(57.5%)
51-100 cm	21 cm/s (53.3%)	28 cm/s(40.3%)	23 cm/s(42.4%)

WALKING SPEED OF BROILER CHICKENS

GS Group	No. of Birds in each GS group	Speed with No Analgesia	Speed with NSAIDs	Speed with Salixivet
0	47	13.78	15.37	15.11
1	23	8.62	9.90	8.10
2	8	6.91	7.82	7.23

AN INNOVATIVE & COMPLETE FORMULA



Salixivet Is powered by plant origin Multi-component active principles . These active principles include various flavonoids , polyphenols ,alkaloids , & terpenoids like Rutin , salicin,quercetin , pectolinarin & gossypin . These actives work synergistically to produce marked anti-nociception (analgesia) through a Multi-pronged mechanism of action as illustrated above in the diagram.

Some of the biologically active substances in Salixivet (specific polyphenols) play a significant role in reducing proliferation of patheogenic bacteria in the gut thereby promoting health & nutrient retention , and improving overall performance of the animal.

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HOW TO USE SALIXIVET ?

Administer directly to the animal/Bird through mouth or Mix with drinking water/Feed and offer to the animal

MIXING RATES	
Pigs & Birds of all ages	1-1.5 kg Per Ton of feed
Ruminants	1.5-2.5 kg per Ton of Feed

INNOVATIVE SOLUTIONS FOR TOMORROW

Truevet works to translate cutting edge research into solutions which align animal agriculture with sustainability

TRUEVET

VALUE THROUGH INNOVATION

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