

Exploring the link between diet and behaviour: a new way for managing canine stress?

Vicky Payne discusses the effectiveness of dietary intervention in a canine behavioural case history.

The full social and economic sequelae from the COVID-19 pandemic have yet to be felt, but as things start to settle down the relationship between veterinary practice and its clients is beginning to enter a new phase.

Practices are seeing clients back in the consulting room – some of whom have now adopted new behaviours around online information-gathering and purchasing. From a personal and business perspective, this has been a stressful period for professionals and clients alike.

It has also been a stressful time for many dogs, and practice staff will have become all too familiar with dogs presenting with stress-related behavioural issues and with exasperated owners struggling accordingly.

Rescue centres are seeing large numbers of dogs that require rehoming and no veterinary professional needs to be reminded about the emotional consequences of having to euthanase an otherwise healthy animal because of its stress-related behaviour – something that everyone would seek to avoid.

Historically, veterinary professionals have had both pharmaceutical and pheromone treatments available to treat stress and anxiety in dogs, but there is now an effective dietary intervention that has been used successfully alongside these options, in addition to referral to qualified behaviourists.

Neurotransmitter imbalance

In human medicine, an imbalance of neurotransmitters is recognised to be implicated in the presentation of anxiety and stress-responses and, rather than simply treating the condition symptomatically, doctors have sought to enhance neurotransmitter levels to restore normal levels of serotonin and dopamine.

Low serotonin binding in specific brain areas has been shown among people with social anxiety disorder and it is widely recognised that dopamine

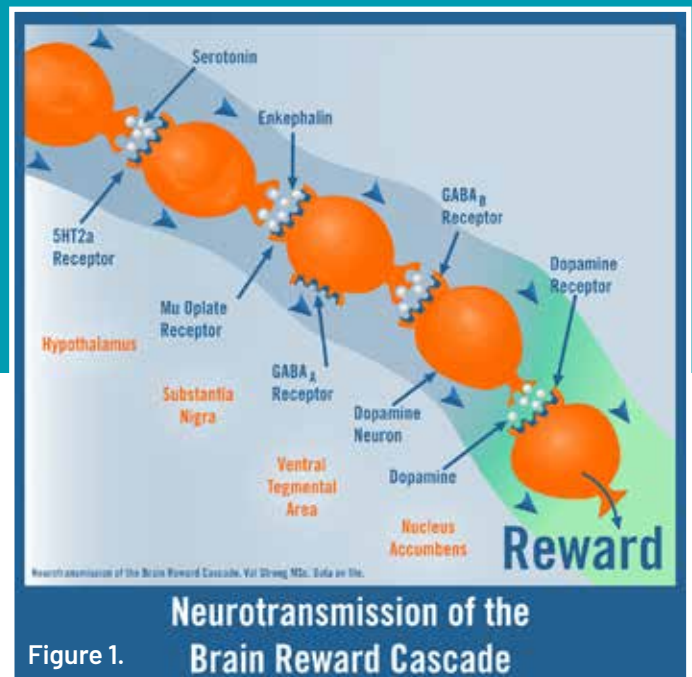


Figure 1.

Neurotransmission of the Brain Reward Cascade

plays a significant role in motivation and reward.

Simply masking the symptoms of imbalanced neurotransmitters may provide transient relief but doesn't address the causative factors and, in canine stress-related behaviours, a significant part of the problem is that such an imbalance is preventing the dog from being willing and able to learn new modified behaviours.

Trials at Wood Green Animal Shelter and other rescue centres have demonstrated that feeding Breakthrough StartUp has allowed the dogs to stabilise neurotransmission and to enhance learning opportunities. The product has previously been used by qualified behaviourists and is now being made available to veterinary professionals.

Animals have evolved to learn about reinforcing events¹. However, if the brain's reinforcement mechanisms are impaired then the ability to experience reinforcing events will be reduced and learning affected accordingly.

In fact, if an individual has a biochemical inability to derive reward from ordinary everyday activities, then behavioural problems such as addictive, compulsive, or impulse control disorders may result².

Dopamine is the primary neurotransmitter of reward in the limbic system, but at least three other neurotransmitters are known to be involved: serotonin, the enkephalins and gamma-aminobutyric acid. In a normal individual, these neurotransmitters work together in a cascade of excitation or inhibition leading to a feeling of well-being, the

ultimate reward³ (**Figure 1**). Learning involves the strengthening of the connections between neural circuits that detect a stimulus, and neural circuits that produce a particular response.

An inability to experience reinforcing events, be they positive or negative, will lead to reduced learning capabilities and associated behaviour problems.

Coping combination

A combination of genetic and environmental factors can affect an animal's ability to cope with novel situations and learning tasks⁴. The secretion of hormones (such as the corticosteroids), through dysregulation of the hypothalamic pituitary adrenal axis in response to prolonged stress, can reduce brain levels of serotonin⁵, explaining the many abnormal behaviour patterns sometimes seen in dogs in compromised environments⁶.

The reward cascade begins with the excitatory activity of serotonin-releasing neurons in the hypothalamus. This then causes the release of the opioid peptide, met-enkephalin, in the ventral tegmental area, which inhibits the activity of neurons that release the inhibitory neurotransmitter gamma-aminobutyric acid.

The disinhibition of dopamine-containing neurons in the ventral tegmental area allows them to release dopamine in the nucleus accumbens, and in certain parts of the hippocampus – completing the cascade and mediating reinforcement effects.

Serotonin, gamma-aminobutyric acid, glutamate, dopamine, and opioid systems have been shown to be involved in mediating positive reinforcement systems. A deficiency in the reward cascade caused by lowered levels of serotonin can lead to negative states, such as depressed mood, dysphoria, irritability, and impulsive behaviour via a decrease of dopamine and reduction of the behavioural inhibition system during learning⁷.

Breakthrough StartUp has been specially formulated to stabilise mood state and emotional responses⁸ by ensuring that all key neurotransmitters involved in the reward cascade reach the brain at the appropriate time – enhancing learning opportunities and enabling the dog to be responsive and able to learn new modified behaviours.

Case study

Biscuit, a soft-coated wheaten terrier, was just 18 months old when his owners decided that they could no longer keep him and he was brought into the veterinary surgery for euthanasia. Looking through his health record, his experienced owners had ensured that Biscuit had received all his vaccinations, worming and appropriate health checks as well as having him castrated at 12 months old.

Although physically healthy, Biscuit had limited opportunities to socialise during the COVID-19 restrictions. Since the lifting of lockdown, Biscuit had become a frenzied young dog who was clearly over-excited: jumping up, whining, and spinning when encountering anything or anyone new. The dog was now out of control and, in his frustration, had begun nipping and snapping at both his owners and others.

His owners sought behavioural advice, but sadly Biscuit snapped at a child. They felt it was not safe to keep him and decided to have him put to sleep; however, it was suggested they contact their local animal shelter rather than having him euthanased. After assessment by the shelter's behaviour specialist, his owners were advised to consider feeding Breakthrough StartUp prior to Biscuit being taken in for rehoming to help him adjust to the stresses of being in kennels.

Four weeks later, when a kennel space became available, Biscuit's owners said they no longer wanted to rehome him. His behaviour had significantly improved, he was calmer, more focused and was now able to learn new responses and behaviours.

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Vicky Payne, BVetMed, DipCABT (RQF Level 6), GradDipVWHM, MRCVS, qualified from the Royal Veterinary College in 2001 and works as an holistic vet in East Sussex. She combines conventional medicine and surgery with acupuncture, herbal medicine, behaviour, and dietary changes to improve pets' physical and mental well-being. Vicky is a patron of English Springer Spaniel Welfare and a trustee for Canine Concern, a charity which offers dog visits to care homes, schools, and even courts.



Soothing pads added to skincare range

CEVA Animal Health has introduced Douxo S3 Calm pads for application to hard-to-reach areas to soothe itchy, irritated skin while maintaining the skin barrier.



Available in packs of 30, the highly-saturated cotton pads can be used on both cats and dogs and remain moist for three months after opening. The firm says they provide optimum tolerance and are free from soap, parabens, sulphates, phthalates, colourants and nanoparticles, with a hypoallergenic "summertime fragrance" which smells like coconut and vanilla.

The Douxo S3 Calm range, which includes shampoo (200ml) and mousse (150ml) formulations, contains a high concentration of ophytrium, a purified natural ingredient which strengthens the mechanical barrier, restores the balance of the protective microbial flora and reduces irritation.

■ www.douxo.com/uk

tPEMF technology loop

INCUBATE Animal Health has launched the Assisi Loop which uses targeted pulsed electromagnetic field (tPEMF) technology to support the body's anti-inflammatory processes – particularly useful in supporting stiff joints. The portable device can be used in clinics or at home as an additional tool for multimodal use, such as supporting joint health. The company describes the loop as a non-pharmaceutical option, non-thermal, sensation-free and well tolerated by pets, with minimal reported side-effects. When in use, it delivers pulses at a frequency of 27.12MHz every two minutes over a 15-minute period.



■ www.incubateanimalhealth.com

Digital cytology for faecal testing

ZOETIS has added digital cytology testing to Vetscan Imagyst – which was introduced in September 2020 and is described as an all-in-one diagnostics technology platform.

With this launch the system now offers a network of remote pathologists in addition to AI technology for faecal testing.

■ www.vetscanimagyst.com



Breakthrough

There's a strong link between diet and behaviour

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