



EXCELLENCE IN PET NUTRITION

# FURINAID PLUS

Nutritional Support for Cats with  
Feline Idiopathic Cystitis



**FURINAID PLUS** is a complementary feedingstuff for cats containing N-Acetyl Glucosamine and L-Tryptophan in a palatable and convenient liquid form. Daily feeding will nutritionally support the Glycosaminoglycan levels in the mucosal barrier of the bladder wall and assist in the maintenance of normal nerve function.

**Instructions for proper use:**

Mix **FURINAID PLUS** well into the feed. Feed each cat individually.

**Feeding Instructions first 14 days:** 6 ml per day.

**Feeding Instructions thereafter for maintenance:** 4 ml per day.

The dosing pump attached to this container dispenses 2ml.

**Composition:**

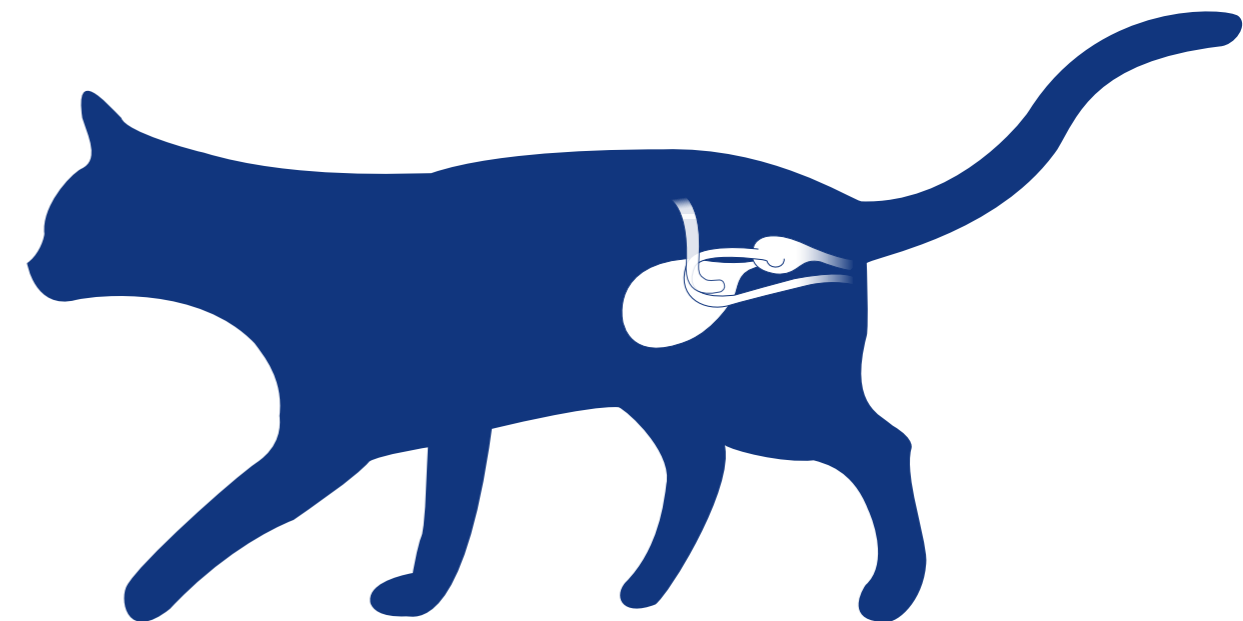
N-Acetyl Glucosamine 6.25% w/v, Roast meat flavouring (derived from *Saccharomyces Cerevisiae*).

Additives	per 1 Litre
L-Tryptophan	8,000 mg

PRESENTATION: **200ML**



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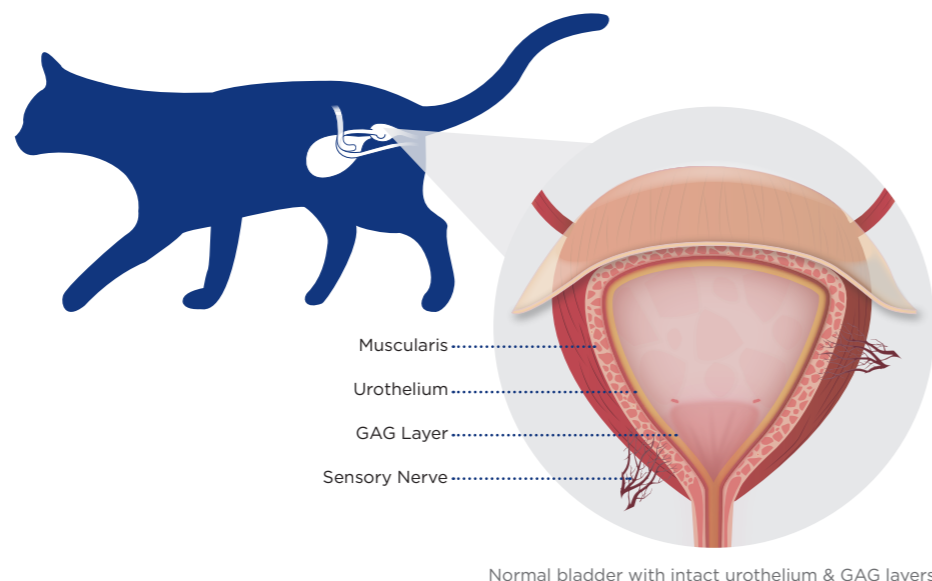
# FURINAID PLUS

## Feline Idiopathic Cystitis (FIC)

Many studies have shown that Feline Idiopathic Cystitis (FIC) is the result of multiple complex interactions between the bladder, nervous system, endocrine system, husbandry practices and the environment of the cat. FIC is characterised by symptoms of cystitis without any evidence of bacterial cystitis and findings include bladder urothelial ulceration with inflammation and fibrosis (Buffington et al.) FIC may result from alterations in the protective glycosaminoglycan (GAG) layer that lines the bladder (R.E. Hurst et al.).

### Structure and function of the bladder wall

The bladder wall has 3 layers - the Mucosa, the Submucosa and the Muscularis. The Mucosa is the innermost layer and lines the bladder, ureter and urethra. The mucosa membrane is lined with urothelial cells and a glycosaminoglycan (GAG) layer coats the surface of these cells. The GAG layer prevents microbes and crystals from sticking to the bladder lining and maintains active defence against bacteria (R.E. Hurst et al.). The unique barrier properties of the urothelial surface membrane of the bladder ensures urine storage (Lavelle et al).



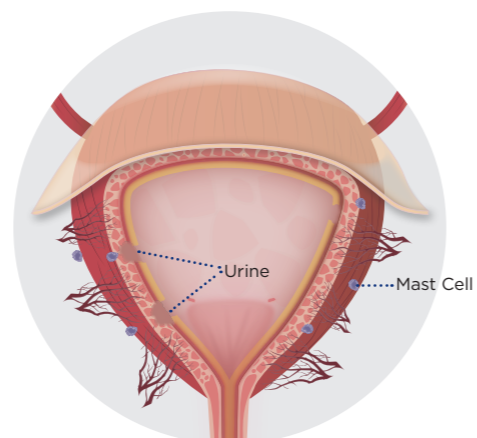
Normal bladder with intact urothelium & GAG layers

### Stress - Effects on the Nervous system & neurogenic inflammation

Any defect in the urothelial and GAG layers may allow urine to permeate into the bladder wall and constituents of the urine can contact the sensory nerves and result in neurogenic bladder inflammation. The sensory nerves, mainly unmyelinated pain fibers (C-fibers), are located in the submucosa. When these C-fibers are stimulated, by triggering factors such as stress or contents of the urine, pain signals are sent to the brain and the neurotransmitter substance P (SP) is released by the nerve endings.

Interaction of SP with receptors on the bladder wall results in vascular leakage, which causes pain, inflammation, increased permeability of the bladder wall and mast cell degranulation. Mast cell degranulation results in the release

of inflammatory mediators which can further exacerbate the effect of the c-fibres.



Increased bladder permeability - the urothelial and GAG layers are damaged allowing urine to permeate into the bladder wall.



### Clinical signs of Feline Idiopathic Cystitis (FIC) include:

- Signs of difficulty and pain when urinating (dysuria).
- Increased frequency of urination (pollakiuria).
- Blood in the urine (hematuria).
- Urination outside litter box and urgency to urinate.
- Complete obstruction to the urine outflow.
- Behavioural change.
- Loss of litter box training.
- Aggression.

### Stress

It has been reported that stress may play an important role in triggering and/or exacerbating FIC. Westropp et al. found that cats with FIC appeared to have altered bladder permeability especially during the period of initial stress.

### Stressors include:

- Living in a multiple animal household.
- Absence of activity and environmental stimulus.
- Moving house or travel.
- Household routine change.
- Abrupt changes in diet, weather or environment.

### Combatting stress

L-tryptophan is an amino acid and is a precursor to neurotransmitters serotonin and melatonin. Serotonin is also known as the "happiness neurotransmitter," and plays a role in cognitive and learning ability, ensuring moods are stable, regulating sleep patterns, and controlling appetite and digestion. Supplementing with **FURINAID PLUS** will provide L-Tryptophan which may improve the mood and relieve stress and anxiety in cats.

A study by Pereira et al. evaluated the possible effect of L-Tryptophan on the general behaviour of cats and the efficacy of short-term supplementation of L-Tryptophan, specifically the therapeutic effectiveness on behavioural responses associated with anxiety and stress related disorders.

25 multi-housed cats (10 males, 15 females) were observed and after L-Tryptophan supplementation all the Stereotype's (p<0.01), Vocalization (p>0.05), Agonistic Behaviour (p<0.01), Affiliative Behaviour, Exploring and Sustaining (p<0.01) behaviours decreased. House Soiling, Scratching and Agonistic Interactions inside the group significantly decreased (p<0.05). These results suggest that supplementation of L-Tryptophan had an effect in changing the frequency of the stress related behaviours and reduces anxiety signals.

### Replenishing the protective GAG Layer

Studies in cats have shown that GAG excretion is decreased in cats with Interstitial Cystitis (Buffington et al). Panchaphanpong et al. evaluated the effects of oral administration of N-Acetyl Glucosamine (NAG) on plasma and urine concentrations of GAG's in cats with FIC and concluded that administration of 250mg of NAG daily significantly increased plasma concentrations after 21 days treatment. **FURINAID PLUS** contains N-Acetyl Glucosamine and provides GAG's that will attach to the defective urothelium and will decrease bladder permeability. **FURINAID PLUS** regenerates and keeps the GAG protective layer healthy.

NAG is metabolised differently to other forms of Glucosamine. NAG is further along the pathway for GAG formation than other forms of Glucosamine: D-glucosamine → NAG → GAG. NAG is taken up by the liver and other tissues and is less available for cartilage repair (Kayne et al). Daily feeding of **FURINAID PLUS** will nutritionally support the GAG levels in the mucosal surface of the bladder wall.

### What type of cats suffer from Feline Idiopathic Cystitis:

- FIC can affect cats of any age but mostly affects young to middle aged cats.
- Over-weight cats.
- Neutered cats are more susceptible.
- Persian and black & white domestic cats are predisposed.
- Occurs equally in male & female cats.
- Stress - moving house or travelling, weather changes, or when household routine is disrupted.

### Management of FIC

#### Reduce stress by:

- Offering a safe clean area in which the cat can urinate.
- Avoiding covered litter boxes and using unscented, fine-grained type litter.
- Reduce overcrowding of pets.
- Providing the cat with a scratch post or toys can all help alleviate stress.

#### Encourage drinking more water by:

- Providing fresh drinking water.
- Supplying a water fountain.
- Leave out many water bowls or add water to food.