

Using Multi-Modal Formula

The average guinea pig will require 30-50g of VetCarePlus per day (or 40g/Kg body weight/day. VetCarePlus may be fed freely, however weight should be monitored regularly.

Fresh hay and water should always be available. Transition guinea pigs from their previous diet to VetCarePlus Multi-Modal Formula slowly over a 2-6 week period to reduce stress.

The benefits...

- 25% crude fibre
- Rich in vitamin C
- Prepared with selected Timothy Hay
- 16% protein
- Lower energy content
- No need to limit intake, although weight should be monitored
- Rich in long fibre
- Encourages extended feeding time
- Promotes dental wear
- A nutritionally complete and balanced diet
- Wheat and gluten free
- No artificial colours or flavours
- Zero added sugar

The range also includes...



URINARY TRACT HEALTH    WEIGHT MANAGEMENT    DIGESTIVE HEALTH

NEW! Monoforage® diet with 25% crude fibre and prebiotics



Have you tried RECOVERY or RECOVERYPLUS?



RECOVERY    RECOVERYPLUS

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Supreme®

RABBIT  
URINARY

RABBIT  
WEIGHT

RABBIT  
DIGESTIVE

RECOVERY

RECOVERYPLUS

MULTI-MODAL

VetCarePlus Multi-Modal Formula for guinea pigs

Nutritional Profile

Crude fibre	High	GI health Dental health Behavioural enrichment
Monoforage® Technology		Extended chewing time Long fibre for digestive health
Calcium	Reduced	Decreases urinary concentration of calcium
Omega-3 fatty acids	High	Calms inflamed tissues
Cranberry	Added	Antioxidant, urinary aid
Vitamin C	High	To provide for higher requirements in stressful situations
Protein	High quality	To sustain protein reserves and support the immune system
Calorie content	Reduced	Helps avoid weight gain
Dandelion/ Nettle	Added	Natural diuretics Antioxidant

NEW!  
Available  
1st June



Indications

Multi-Modal Formula is suitable for guinea pigs:

- at all lifestages for long term feeding
- susceptible to digestive upset
- susceptible to urinary tract disorders
- prone to regular inappetence and reluctance to feed
- prone to weight gain, overweight or that experience wide fluctuations in weight
- susceptible to behavioural problems, such as barbering, related to boredom



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# VetCarePlus Multi-Modal Formula for guinea pigs

## Digestive Health

### KEY BENEFITS

- High fibre
- Long fibre

Guinea pigs are hind gut fermenters, with fermentation occurring in both the caecum and the colon – although mainly in the caecum (in contrast to other hind gut fermenters such as the horse that mainly rely on colonic fermentation).Although they practice coprophagy they do not produce different faeces (caecotrophs) as a rabbit would. Guinea pigs use 80 per cent of their digestive capacity for fermentation compared to just 51 per cent of the rabbit’s digestive capacity. Being able to adequately ferment fibrous material depends on the total volume available for fermentation in the digestive tract, the retention time of ingested material, fibre length and the makeup of the microbial population inhabiting the hindgut. A high fibre diet has significant volume and provides a substrate for gut microbes to produce volatile fatty acids as an energy source.

## Urinary Tract Disorders

### KEY BENEFITS

- Low calcium
- High omega-3 fatty acids
- Cranberries
- Natural herbs

Predisposing factors - Weight control, through higher fibre levels

### Low calcium

Like rabbits, guinea pigs do not regulate calcium absorption from the gut – the amount absorbed is directly proportional to the amount consumed. Excess absorbed calcium is excreted through the urinary tract. A predisposition to urolithiasis can occur if high levels of calcium levels are being consumed in the diet, though the calcium content of the diet per se can often be misleading as some calcium salts are more easily absorbed than others. Multi-Modal Formula provides a low calcium diet suitable for feeding to guinea pigs with urinary tract disorders.

The Ca:P ratio is also important and ideally should be between 1.5:1 and 2:1 respectively. Other predisposing factors that have been suggested include the presence of an alkali urine pH – which affects the solubility of calcium salts, low water intake, infection, obesity and limited exercise. If these assumptions are correct then weight control and digestive health are likely to play a key role in the prevention of urolithiasis.

### High Omega-3

Multi-Modal formula also contains soya bean oil and linseed – both are excellent sources of omega-3 fatty acids. Omega-3 fatty acids are known to calm inflammatory processes. One recent study found that omega 3 fatty acids from fish oil or flax seed (linseed) reduced signs of osteoarthritis in guinea pigs by 50 per cent.<sup>3</sup> Although the benefits of fish oil have been fairly well established, it was less clear whether other omega 3s exerted the same effects but this study has confirmed some significant benefits. The benefits of omega 3 are increasingly being talked about with reference to a whole host of conditions including urinary disorders.

### Cranberries

Multi-Modal Formula also contains cranberries. Contrary to popular opinion, cranberries do not work by acidifying urine. Cranberries contain proanthocyanidins (PACs), which inhibit the adhesion of bacteria<sup>4,5,6</sup> including Escherichia coli, to the urinary tract epithelium. The Hawkins study<sup>2</sup> identified that despite most guinea pigs being on antibacterials, 16 per cent had urine samples positive for Corynebacterium renale, which was the most commonly identified bacteria, as well as Streps, Staphs and E.Coli, suggesting that bacteria may play an important role in the development of uroliths in guinea pigs.

### Dandelion, Nettle – Natural Diuretics

Dandelion is highly nutritious and one of the richest sources of vitamin A and beta carotene, as well as being an excellent source of fibre, potassium, iron, calcium, magnesium, phosphorus and the B vitamins, thiamine and riboflavin, and protein.

Dandelion leaves are used as a diuretic to stimulate the excretion of urine and to support kidney function, whilst the flowers are used for mild pain relief and have anti-oxidant properties.<sup>7,8,9</sup> Apigenin and Luteolin, flavanoid glycosides may be responsible for the diuretic effect. Dandelion has marked antioxidant activity in-vitro<sup>8,9</sup> and provides mild pain relief through inhibition of nitric oxide production and COX2 expression. Nettle is also a diuretic and it may be supportive in urinary tract infections and inflammation.<sup>10</sup>

## Non Specific Stress/ Reluctance to Feed

### KEY BENEFITS

- Rich in vitamin C
- Natural herbs
- High fibre, high quality ingredients for palatability

### Vitamin C

Vitamin C has to be provided in the diet of guinea pigs as they are unable to synthesise their own supply due to a lack of the enzyme L-gulonolactone oxidase in the glucose-ascorbic acid pathway. Vitamin C is a water soluble vitamin and therefore rapidly becomes depleted. In general, Vitamin C will only be retained in the tissues for a maximum of 4 days.

The requirement for vitamin C is also increased in certain situations: growth, pregnancy and lactation, as well as temperature and humidity, can affect vitamin C status. Stress due to handling, trauma, concurrent illness, or rivalry may also increase the requirement. This situation can be exacerbated by a reduction in food intake. In these circumstances it is worth considering administering supplemental vitamin C, or where the guinea pig is still eating, offering a food rich in vitamin C.

### Echinacea

Echinacea has also been included in the Multi-Modal Formula. A 1994 systematic review of 26 controlled clinical trials concluded that most studies were not methodologically rigorous, but there was enough evidence to support that echinacea was an effective immuno-modulator.<sup>11</sup>

## Behaviour

### KEY BENEFITS

- High fibre
- Long fibre
- Extended chewing time

Guinea pigs are especially prone to developing behavioural problems related to boredom – these can include high-pitched screeching, biting or barbering (hair chewing) of cage mates or stereotypical repetitive, obsessive behaviours.

High fibre diets that require extended chewing time are likely to be beneficial as a way of enriching the guinea pig’s environment. Also the lower energy density of the diet means more needs to be eaten to meet calorie requirements, making eating a more stimulating and time occupying activity.

## Weight Management

### KEY BENEFITS

- High fibre
- Long fibre
- 16 % protein

Weight gain can be hard to assess in the guinea pig due to the relatively blocky body shape. In general, an animal is classified as obese when the ribcage is not visible, the bones of the chest are barely palpable, and the body weight is noticeably more than is normal for the type of animal.

If weight reduction is required, then a one per cent per week weight loss target is realistic. Rather than reducing quantities fed – and potentially reducing delivery of all nutrients, some of which will still be needed in the same quantities – it is better to feed a diet with lower energy density. High fibre diets are well accepted by guinea pigs and may influence satiety.

Feeding hay may appear to be a valid strategy but the vitamin content can be low. Guinea pigs also require relatively more protein than rabbits and a hay only diet fed long term can be protein deficient. Standard grass hay may only contain 9 per cent protein, or even less depending on the stage of cutting and the amount of leaf present. Fresh vegetables can be used as a means of increasing vitamin C in the diet but take care to select those low in natural sugars. Where there is evidence of concurrent urinary problems it may also be beneficial to restrict leafy green vegetables high in oxalate.

Multi-Modal formula contains the higher protein levels guinea pigs need, is rich in vitamin C and contains high levels of fibre, making it the ideal choice when it comes to achieving optimal body weights in guinea pigs.



**IN 2009** JAVMA published a wide ranging study<sup>2</sup> which looked at guinea pig uroliths collected prospectively across the US for a three year period up to 2007 and historical samples dating from 1985-2003.\* Infrared spectroscopy and x-ray diffractometry were used to indentify the uroliths. The results were that over 88 per cent of calculi were made up of 100 per cent calcium carbonate. The same study found that urine samples submitted with the stones were already dilute, suggesting that inadequate water intake or increased water excreted through the faeces leading to more concentrated urine, might be less likely as a predisposing factor.

