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# Guinea Pig: Nutritional Requirements, Feed Habits, Food Patterns, Digestive Structure, Functions and Feeding

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The domestic guinea pig (also commonly called the cavy after its scientific name) is a species ofrodent belonging to the family caviidae and the genus cavia. Despite their common name, these animals are not pigs nor do they come from guinea. They originated in Andes (present day Peru,Argentina, and Brazil). They are used in research mainly for production of sera, vaccines and other biological products. They are used as models for human disease conditions such as juvenile diabetes, tuberculosis, scurvy, and pregnancy complications. They are important for diagnostic reasons due to its high susceptibility to infectious diseases like diphtheria, leptospirosis and brucellosis.

**Table 1. General characteristics of Guinea pig**

| Characteristic | Guinea pig |
|---|---|
| Scientific name | Cavia porcellus |
| Birth weight | 85-90g |
| Litter size | 3-4 |
| Adult male | Boar |
| Adult female | sow |
| Mature wt | 800-1200g (male)<br>700-900g (female) |
| Gestation period | 59-72 days |
| Weaning age | 14-21 days |
| Feed intake by adult animal | 30-60g/day |

## BEHAVIOR

**Resistance to Environmental and Dietary Change:** Guinea pigs are indeed sensitive to changes in their environment and diet. It's crucial to establish a proper diet early in their life and maintain


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consistency. Sudden changes can lead to stress, depression, and a refusal to eat.

**Social Nature:** Guinea pigs are social animals and often prefer the company of other guinea pigs. When housing them together, it's essential to monitor their interactions for signs of aggression to ensure their well-being. If they are kept alone, they will need extra playtime and attention from their human companions to prevent loneliness and boredom.

**Fear Response:** Guinea pigs have a unique fear response, which involves freezing or making an explosive attempt to escape when frightened. This behavior is different from the typical "fight or flight" response seen in many other animals.

**Coprophagia:** While it might seem unusual, coprophagia (eating their own feces) is a normal and necessary behavior for guinea pigs. This process allows them to obtain valuable nutrients that can only be absorbed through the digestive system's two-pass method

**DIGESTIVE PHYSIOLOGY**

- They have a simple stomach lined with glandular epithelium.
- It has large semicircular caecum with numerous lateral pouches
- In caecum, synthesis of B vitamins and indispensable amino acids occur by
- microorganisms and recycling of intestinal contents by coprophagy.
- Intestine contains predominantly gram-positive bacteria

The guinea pig is widely recognized in the realm of nutrition due to its unique requirement for dietary vitamin C. This distinctive characteristic has rendered guinea pigs valuable subjects for research in areas such as collagen biosynthesis, wound healing, and bone growth. Additionally, young guinea pigs have a relatively heightened dietary need for arginine and folic acid. In its natural habitat, the guinea pig is a herbivore, primarily consuming plant-based foods. Its molar teeth are particularly adapted for grinding, much like other rodent species. Notably, the incisors of guinea pigs continue to grow continuously throughout their lives, similar to rats, mice, and rabbits.

The guinea pig possesses a simple stomach, completely lined with glandular epithelium. Furthermore, it boasts a sizable, semicircular caecum equipped with numerous lateral pouches, akin to that of rabbits. This caecum plays a vital role in various digestive functions, including the synthesis of B vitamins and indispensable amino acids by microbial organisms, as well as the recycling of intestinal contents through coprophagy.



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**Table 2. Recommended Greens and Vegetables**

| | | |
|---|---|---|
| Kale | Kale | Kale |
| Parsley | Parsley | Parsley |
| Collard Greens | Collard Greens | Collard Greens |
| Broccoli heads and leaves | Broccoli heads and leaves | Broccoli heads and leaves |
| Beet greens | Beet greens | Beet greens |
| Spinach | Spinach | Spinach |

**Table 3. Recommended Treat Foods (Fed in moderation):**

| | | |
|---|---|---|
| Strawberries | Strawberries | Strawberries |
| Raspberries | Raspberries | Raspberries |
| Orange | Orange | Orange |
| Honeydew melon | Honeydew melon | Honeydew melon |

**Nutrient Requirements**

Variation in requirements can occur as a consequence of several factors such as developmentalstage, reproductive activity, age, gender, strain etc.

**Energy requirements**

The guinea pig can utilize fibrous feed stuffs more efficiently than mice and rats. The guinea pig is a hindgut fermenter and can derive energy from fermentation of fibrous material in caecum. The maintenance energy requirement of guinea pig is 136 kcal ME/$BW^{.75}$/day. Sucrose, glucose, lactose and starch have been used as primary energy sources in purified diets for guinea pigs.

**Protein requirements**

Diets that provide 18-20% protein result in satisfactory reproduction. 30% of protein requirement should come from animal protein sources like skimmed milk powder, fishmeal etc. The clinical signs of protein deficiency are similar to kwashiorkor syndrome including reduced activity, mild hair loss and extensive oedema of face and forelimbs. Thus, guinea pigs are suitable models for the study of human protein calorie malnutrition.

**Essential fatty acids:** - Essential fatty acids required as linoleic acid, 4 g/ kg of dry diet is added. Deficiency of essential fatty acids results in retardation of growth, dermatitis and poor growth of fur.

**Vitamins in guinea pig`s diet**

**Vitamin A:** - Beta carotene is used by guinea pig as a source of vitamin A but it`s efficiency is only 40% that of preformed vitamin A. Diets containing 6.6 mg retinol / kg diet maintained optimal health and slightly positive vitamin A balance in guinea pigs . Vitamin A deficiency leads to poor growth, weight loss and corneal opacity.



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**Vitamin C: -** They require dietary source of vitamin C due to lack of enzyme L- gulonolactone oxidase. As per BIS specification, vitamin C requirement is 200 mg / kg compounded feed. Early signs of vitamin C deficiency in guinea pigs include reduced feed intake, weight loss, anemia and widespread hemorrhages. (Vitamin C deficiency cause impaired clotting mechanism)

**Vitamin D: -** not much effect if the ratio of Ca: P is satisfactory.

**Vitamin E: -** It is required for reproduction. It is desirable to supplement vitamin E 0.15 mg / animal per day.

**FEEDING OF GUINEA PIG**

Young ones are born with full coat of hair with their eyes open. Within few hours, they will be running around, nibbling leafy materials. Newborn animals can consume semisolid and solid food immediately although weaning is followed around 3 weeks of age. Guinea pig normally gains 5 -7 g/day during rapid growth period when allowed to eat *adlibitum*. Growth slows after 2 months and maturity is reached about 5 months. Weight gain can continue until 12-15 months of age.

**FEEDING RATE**

Growing animal: - 20-30g

Adult: - 30-50 g

Pregnant and lactating: -40-60 g

**Table 4. BIS SPECIFICATION FOR COMPOUNDED FEEDS FOR GUINEA PIG**

| Parameter | Quantity |
|---|---|
| Moisture (max) | 10% |
| Crude Protein (min) | 22% |
| Ether Extract (min) | 4% |
| Crude Fibre (max) | 9-14% |
| Total Ash (max) | 9% |
| AIA (max) | 1% |
| Calcium (min) | 1.2% |
| Phosphorous (min) | 0.6% |
| Vitamin C (mg/kg diet) | 200mg |



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