

# DIAGNOSTIC & TREATMENT UPDATE FOR THE REHABILITATION OF INSECTIVOROUS BATS

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## 2007 MEALWORM MEDIUM

(ALSO PROVIDES TARTAR CONTROL)

### MEALWORM MEDIUM

#### INGREDIENTS

- Chick starter. NOTE: Do not use chick starter in its original granule form. Instead, use a blender on a high-speed setting to turn the granules into powder.
- Wheat germ
- Calcium carbonate powder

(Approximately 60% powdered chick starter, 38.5% wheat germ, and 1.5% calcium carbonate by volume.)

#### STEP 1 - Fortifying Mealworms

Put mealworms in the above medium and allow them to feed for one to two days before feeding to bats (optimal calcium levels in mealworms are reached in one to two days). Provide moisture for mealworms by placing sliced apple, sweet potato, organic greens, etc. on top of the medium. On the second day, refrigerate the worms and medium in a ventilated container or sift mealworms from the medium and put them into a ventilated container with a small amount of wheat bran or fresh medium to refrigerate (see photo A) .



#### STEP 2 - Preparing Mealworms for Self-feeding Bats

**MORNING** - Remove mealworms that will be used for the evening feeding from the refrigerator. Sift them in a strainer until they are free of wheat bran and other debris, place them in a pan and add an ample amount of fresh, thinly sliced vegetables and fruit (e.g., carrots, corn on the cob, sweet potato, squash, green beans, apple) for moisture (see photo B). Place the pan in an area away from bright lights and allow mealworms to feed throughout the day.



**EVENING** - Remove vegetables and fruit from the pan of mealworms. (Uneaten food can be stored in the refrigerator and reused). Sift mealworms in a strainer to remove feces and other debris. Place sifted mealworms in a pan and sprinkle them with the powdered contents of one 50 to 75mg CoQ10 capsule. Thoroughly toss the worms until they are well coated. Add a liberal amount of powdered D.D.S. Dental Biscuits and Missing Link® for Felines. Toss the worms again until they are lightly coated with the supplements. Sift the mealworms to remove excess powdered supplements (which can be saved and reused the following night). Twice a week, also add a pinch of Vionate® powder to the mealworms before feeding to the bats.

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## 2007 BLENDED FOOD RECIPE

(ALSO PROVIDES TARTAR CONTROL)

### **BLENDED FOOD RECIPE**

Blended food is a mixture of mealworms, baby food, and vitamin/mineral supplements. It is fed to emaciated bats, bats with dental disorders, or bats that are just too weak or frightened to eat whole mealworms. It is also added to milk formula for pups near weaning age.

### **INGREDIENTS**

- 1.5 cups frozen mealworms (about 1200 large mealworms)
- 1/2 cup of cold water (120ml)

### **STEP 1 - Blending Mealworms**

Pour water in blender. Gradually add frozen mealworms while blending on the highest setting. Blend the mixture until it is the consistency of honey. Freeze the blended mixture in small containers or freezer bags.

**NOTE: The mixture must remain cool while blending—if it overheats it will spoil.** Use a high-speed glass blender to prevent overheating.

### **STEP 2 - Preparing Frozen, Blended Mealworms for Feeding**

(feeds 15 to 20 bats; adjust accordingly)

- 1 cup blended mealworms, partially thawed
- 1 tablespoon water
- 2 tablespoons (30ml) of fruit or vegetable baby food (bland flavors - see below\*)
- 2 teaspoons (10ml) Missing Link® for felines
- 2 teaspoons (10ml) of Vionate® vitamin/mineral supplement
- 2 teaspoons powdered (10ml) D.D.S. Dental Biscuits®
- 1/2 teaspoon (2.5ml) of Barlean's Flax oil with Lignans. (NOTE: If diarrhea occurs decrease the amount used by half) .
- Powder contents of one 50 to 75mg CoQ10 capsules capsule, or one scoop CoQ10 pure powder.
- 1/2 tsp of Liquid Oral Care™

Allow frozen mealworm mixture to partially thaw in a bowl. Then add the baby food, water, and vitamin supplements. Stir until smooth (i.e., the consistency of applesauce). Use 3ml syringes to feed to bats. Warm syringes in a cup of warm water before feeding. Adult bats typically eat between 1 to 3mls of blended food. (Dispose of uneaten mixture. DO NOT reheat as blended food spoils quickly.

\*Note: Use only baby foods with bland flavors (e.g., corn, squash, carrots, peas, green beans, apple, pears, plums, and sweet potato). Avoid baby foods with additives and exotic flavors).

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## © Bat World Sanctuary, 2005 2007 BLENDED ANALYSIS

### Blended Mealworm Diet Analysis

Moisture (%)	74.91	//////
Dry Matter (%)	25.09	//////
Crude Protein (%)	9.75	38.9
Acid Hydrolysis Fat (%)	6.49	25.9
Crude Fiber (%)	1.55	6.19
Ash (%)	1.67	6.64
Sulfur (%)	0.07	0.28
Phosphorus (%)	0.32	1.29
Potassium (%)	0.22	0.87
Magnesium (%)	0.048	0.192
Calcium (%)	0.43	1.70
Sodium (%)	0.05	0.20
Iron (ppm)	42	167
Manganese (ppm)	8	32
Copper (ppm)	5	20
Zinc (ppm)	29	116
Vitamin A (as Retinol only) (IU/100 g)	312	
Ascorbic Acid (Vitamin C) (mg/100 g)	< 6	

### Amino Acid Analysis

Analysis	Level		Detection	
	Found	Units	Limit	Method
Alanine	0.80	%	0.01	HPLC-PCD
Arginine	0.48	%	0.01	HPLC-PCD
Aspartic acid	0.61	%	0.01	HPLC-PCD
Cystine	0.14	%	0.01	HPLC-PCD
Glutamic acid	1.56	%	0.01	HPLC-PCD
Glycine	0.50	%	0.01	HPLC-PCD
Histidine	0.29	%	0.01	HPLC-PCD
Isoleucine	0.22	%	0.01	HPLC-PCD
Leucine	0.99	%	0.01	HPLC-PCD
Total lysine	0.29	%	0.01	HPLC/PCD
Methionine	0.14	%	0.01	HPLC-PCD
Phenylalanine	0.58	%	0.01	HPLC-PCD
Proline	0.79	%	0.01	HPLC-PCD
Serine	0.41	%	0.01	HPLC-PCD
Threonine	0.37	%	0.01	HPLC-PCD
Tyrosine	0.50	%	0.01	HPLC-PCD
Tryptophan	0.11	%	0.01	HPLC-PCD
Valine	0.63	%	0.01	HPLC-PCD