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## NUTRITIONAL MANAGEMENT OF ARABIAN TAHRS IN CAPTIVITY

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### ABSTRACT

A nutritional management system for Arabian tahrs under captivity was formulated at the Management of Nature Conservation (MNC) located at the foothills of Jebel Hafeet in Al Ain, UAE which is believed to shelter the world's biggest Arabian tahr population in captivity. The center operates under the Department of the President's Affairs, UAE. There is no relevant published data available regarding the nutritional and dietary requirements for Arabian tahr. A diet formula and nutritional management system were developed for the captive management of Arabian tahrs under captivity by assessing the required protein, fibre, mineral levels and vitamin supplements without compromising the quality control measures.

**Keywords:** Arabian tahr, captivity nutrition, UAE

### INTRODUCTION

Tahrs are Asian artiodactyl ungulates coming under Bovidae family and related to the wild goats. Apart from Arabian tahr, other species of tahr include, Himalaya tahr, native to Himalayas, Tibet, northern parts of

Indian subcontinent and Nepal and Nilgiri tahr (*Nilgiritragus hylorcrius*), endemic to the Nilgiri hills, Western and Eastern Ghats in Tamil Nadu and Kerala states of India. The Arabian tahr was removed from the *Hemitragus* genus and assigned to the monotypic genus *Arabitragus* which showed a weak genetic relationship with other *Hemitragus* species. The Arabian tahr is most closely allied with the Aoudad (*Ammotragus lervia*).

The Arabian tahr, a goat-like mammal and the smallest in Tahr family, are endemic to United Arab Emirates (UAE). The Arabian tahr lives on areas of steep slopes. There is a decreasing trend in the population of Arabian tahr and they are endangered due to intense overgrazing, poaching, loss of its natural habitat, competition from feral goats for feed and water, hunting and climate change. The MNC located at the foothills of Jebel Hafeet in Al Ain now houses more than 1000 Arabian tahrs, which is a far cry from its starting point with only 10 Arabian Tahrs in 2005. A well-balanced diet for Arabian Tahr was developed at the MNC Feed mill with required protein, fibre,

mineral levels and vitamin supplements following strict good quality control measures.

## FEED AND FEEDING

Arabian Tahrs have been described as browsers/concentrate selectors. They are highly selective and tend to choose a diet consisting of foliage and fruits. They consume leaves, grass, fruits and twigs of some trees. Browsers are more sensitive to abrupt changes in feeds than grazers and characterized by small stomachs normally filled to only 50-60% of their capacity. Arabian Tahrs are strict browsers, eating mainly leaves, bark, seeds, and fruits in the diverse vegetation they prefer. Water is usually the limiting resource and droughts can seriously affect Arabian tahr populations. As like other ruminants, a proper understanding of the digestive anatomy and physiology is essential for optimizing the feeding practice and health for Arabian Tahr. Major challenge in captive wild ruminant's nutrition is the simultaneous provision of an adequate energy supply and prevention of ruminal acidosis. Pectin and other soluble fibre components are readily available energy source for ruminants but their fermentation is not fast in contrast to starch or sugars, that result in an acidotic rumen condition. Therefore, high proportion of pectin-rich ingredients, (1 to 5% of total diet are typically suitable) and a low proportion of starches and sugars is

considered for wild ruminants and inclusion of sodium carbonate as a buffering substance to provide additional protection against rumen acidosis is also beneficial.

## Nutrient Requirement

Captive browsing ruminants are particularly susceptible to gastrointestinal disorders, and inappropriate diets are an underlying factor. Nutrient composition of browse and pelleted feed used at MNC were analysed and compared against current recommendations for exotic ungulates. A new pellet feed with 16% crude protein (CP) was formulated based on these observations. The Hi fiber browser pellet is a nutritionally-balanced, starch-phosphorus controlled and highly palatable, high fiber pellets for wild herbivores, managed under captivity that support a healthy rumen (Table 1).

### Feed requirement for buck

Body weight: 40 kg

Daily DM intake by

body weight: 2.7 % - 1.08 kg DM

Energy requirement: 1500 kcal/day

Protein requirement: 90 g/day

(40% bypass protein)

Mineral requirement: Ca-1.7 g/day

P 1.3 g/day

Vitamin: Vit.A-945 IU/day

Vit.E-160 IU/day

*Feeding: 10% more during growing and breeding period*

**Table 1. Composition of Hi-Fiber Browser pellet-16 (DM basis)**

<b>Nutrient</b>	<b>Actual</b>	<b>Minerals</b>	<b>Actual</b>
Drymatter	90 %	Calcium	1.5 %
Crude Protein	16 %	Phosphorus	0.35 %
Crude Fat	2.5 %	Sodium	0.37 %
Crude Fibre	20 %	Potassium	1.6 %
Ash	10.6 %	Zinc	167 mg/kg
CP-Bypass	10.7 %	Copper	22 mg /kg
NE	1383 k Cal/kg	Manganese	198 mg/kg
ADF	28 %	Selenium	038 mg/kg
NDF	36 %	Magnesium	3100 mg/kg
Sugar	5 %	<b>Vitamins</b>	
TDN	61 %	Vitamin. A	19826 IU/kg
		Vitamin D3	3957 IU/kg
		Vitamin E	200 mg/kg

**Fig. 1 Arabian tahr (buck)****Feed requirement for doe**

Body weight : 21 kg

Daily DM intake by body

weight : 2.37% = 0.5 kg DM

Energy requirement

: 1100 kCal/day

**Fig. 2 Arabian tahr (doe)**

Protein requirement: 70 g/day

(40% bypass protein)

Mineral requirement: Ca-1.3 g/day

P -0.9 g/day.

Vitamin: Vit.A-785 IU/day

Vit.E-132 IU/day.

Protein requirement during breeding period is 80 g/day.

The general feeding guidelines during different physiological stages is given in Table 2.

**Table 2. Feeding guidelines**

Sl No	Category	Pellet g/day
1	Mature-Does	300
2	Breeding Buck	450
3	Early Pregnancy	400
4	Late Pregnancy	550
5	Lactation	500

In addition

- Rhodes-hay, Alfalfa-hay and Cut branches are offered *ad libitum*
- **Supplements:** Many minerals are required by Arabain Tahrs, the requirement of most being met with good forage and regular concentrate mixture. The major minerals of concern are calcium, phosphorus and salt, which are usually added to their ration, either in grain mix or by mineral blocks.

Ammonium chloride 25% solution is sprayed at the rate of 100 ml per 5 kg pellet and fed to prevent urinary calculi in bucks.

The weight gain observed during gestation was 45g/day, while during late lactation was 12g/day. A weight loss of 17g/day was observed during early lactation period of 60-70 days. Neither weight loss nor gain was observed during mid lactation.

### Hand Rearing of Arabian tahrs

Successful hand rearing of animals (Fig. 3) adhering strict protocols is done taking the following points into consideration:

- Adequate growth
- Proper feeding
- Hygiene
- The stomach capacity of most species can be estimated as 50 ml/kg body wt.
- Overfilling the stomach leads to GI upset, decreased transit time and diarrhoea.
- Daily intake as a rule should not exceed 20% of body weight per day and should be divided into frequent feeding that do not exceed 35-40 ml/kg.
- New born should be fed every 2-4 h.

### Feeding Guidelines for Arabian tahr kids

#### 0-4 days.

- Colostrum - 50ml/kg body wt within one hour
- Followed by 3 feedings of 150 ml/kg body wt within 24 hr (350-450 ml/day).

#### 5-7 days – (Using Awassi Sheep milk- Milk composition is almost similar to Arabian tahr milk)

- 500-700 ml/day by four feeding (150-200 ml per feeding)
- Rate should not be more than 10% of kid body weight

#### 1-2 weeks

- 750 -1000 ml /day by three feeding (250 - 350 ml/feeding)

- Introduce 20-30 g/day of concentrate pellet in the feeding schedule (Hi fiber pellet 16%)

#### 2 to 4 weeks

- Digestive system develops normally
- 1500-2000 ml /day by three feeding
- 50g of pellet /day and little hay and pasture

#### 1 - 3 months

- 600 ml twice a day
- Pellet @ 20 to 25 g/ kg of body weight
- Introduce fruits and vegetables - 100 g per animal
- Ad-lib hay and browse

#### 4 months

- 500 ml milk twice a day
- Pellet @20-25 g per/kg body weight.
- Fruits and vegetables - 150 g/animal
- Ad-lib hay and browse

*Gradually withdraw milk from the feeding schedule*

#### Management of orphan kids

For orphan kids, milk substitution was done by mixing cow milk and evaporated milk in the ratio of 8:1, following the same schedule.

#### Importance of milk replacer

- Should provide the nutrient and fluid necessary for the neonate to thrive
- The composition of milk - should be species specific
- Proper feeding
- Vitamin and mineral supplements



**Fig. 3 Hand feeding of Arabian tahr kid**

#### SUMMARY

The Arabian tahr, a goat-like mammal and the smallest in Tahr family, is endemic to United Arab Emirates, the nutritional and dietary requirements of which are not explored in detail. The general guidelines of feeding Arabian tahr are elaborated with special emphasis to the newly formulated pellet feed. Successful nutritional management plays a pivotal role in maintenance and propagation of this endangered species.

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