Body Condition Scoring for the Arabian Oryx of the Dubai Desert Conservation Reserve

May – July 2013

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Contents

Abstract

This research project started in May 2013 and was based on the Dubai Desert Conservation Reserve situated 60 km South East of Dubai. Noticing a decline in the body condition in the Arabian Oryx population of the Dubai Desert Conservation Reserve (D.D.C.R), it was decided upon to increase the amount of feeding stations and feed in an attempt to increase the Body Condition Score (BCS). While observing the different Oryx herds over a 3 month period, following a scheme for body condition scoring to provide a measurable indicator of the fitness of the Arabian Oryx. After the initial month of the survey the BCS = 1.1 which represents a thin population. At the end of the survey the BCS = 2.2 which represents malnutrition. A steady increase over the past 3 months has shown a steady increase in BCS. Continuing this feeding programme will ensure the continuous improvement of BCS to the predetermined goal of a 3 fit and healthy population.

Introduction

After 3 years of drought in the region and very little palatable vegetation the body condition of the Arabian Oryx population for the Dubai Desert Conservation Reserve has deteriorated drastically. Over the next three months May 2013 to July 2013 the aim is to increase the Oryx food intake by double and attempt to bring the body condition score of the Oryx to healthier population by implementing a new feeding programme until the reserve has sufficient natural vegetation to sustain the Oryx population of the reserve.

A scheme for body condition scoring is adopted as an approach to provide measurable, quantitative and informative indicator of the fitness of the Arabian oryx herd in. The scheme is modified after (Gilbert and Woodfine, 2003) using the dairy cattle body condition scoring developed by University of California (Davis) veterinary medicine extension. The system is based on visual assessment of the back posture of the animal and defining the body condition score according to presence or absence of some features and like musculature, fat deposition, spinal vertebrae and caudal vertebrae. The system adopted after Gilbert and Woodfine have a scale of 6 integer scoring grades where the animals are evaluated using the visual appearance of the spine, musculature and fat deposition (see figure10). However, it is probably general and has some bias for observer effect especially when used to assess reintroduced animals by different staff members. A personal variation among different observers is expected to significantly affect the final result.

The purpose of this study is to determine the body condition scores of the Arabian Oryx before during and after the implementation of the new feeding programme. Current estimates for our Oryx population are between 0 = emaciated and 1= thin animal. Optimum scores after the new feeding programme should be between 2 = malnutrition in the animal and 3 = fit and healthy population. If decreased habitat

quality continues in Oryx home ranges then the amount of Oryx on this reserve would be unsustainable without proper feed supplementation.

Methodology

Body Condition Scoring (BCS)

A key using those parts and features is formulated to be used along with photographs to assign values of body condition scores.

Figure 1 Evaluation chart

Guidelines for BCS

- 0 = Emaciated Condition
- 1 = Thin Animal
- 2 = Malnutrition
- 3 = Fit & Healthy
- 4 = Fattened Animal
- 5 = Obese Animal

1- Assess thurl line (line between hooks, thurl, pins)

- Thurl line is circular forming a crescent……..BCS>3……..(2)
- Thurl line is V-shaped……..BCS<=3……(3)

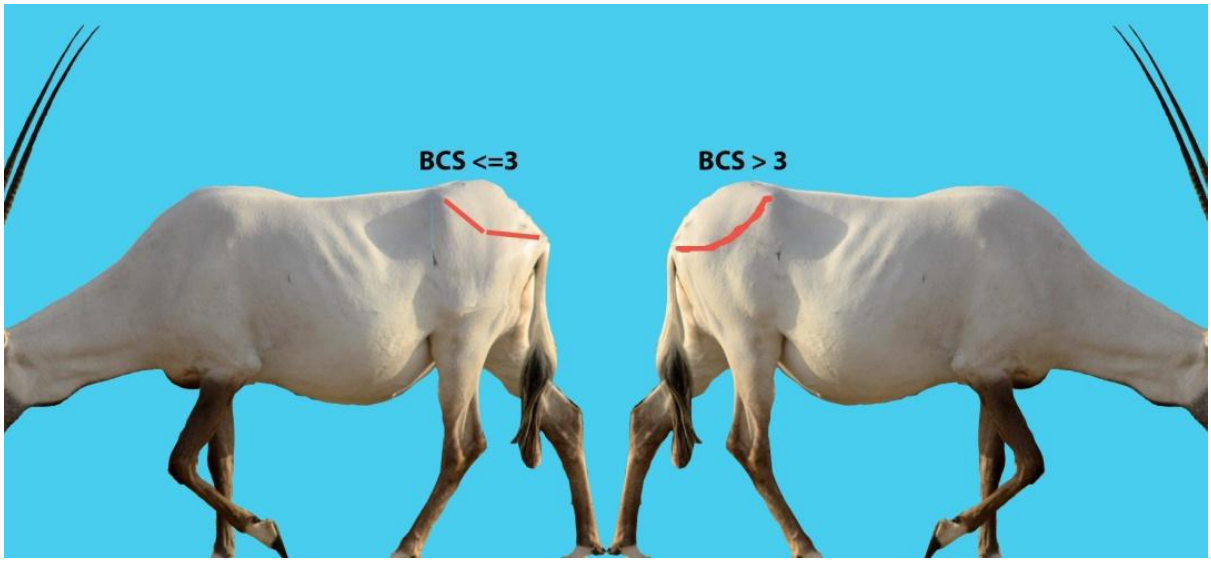


Figure 2 Showing the V-Shaped line or the circular

2- Assess thurl line (line between hooks, thurl, pins)

- Spine is fully covered in fat but tailhead ligament is visible……BCS=4
- Spine is covered with fat forming a groove over the spine & tailhead ligament is not visible……BCS=5

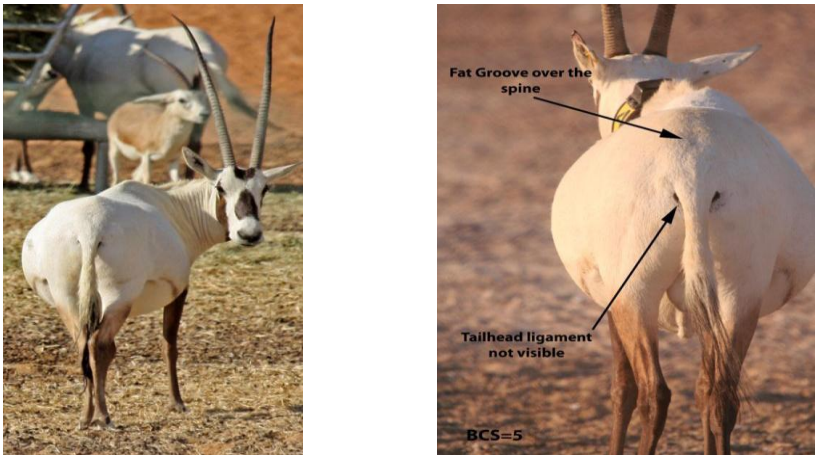
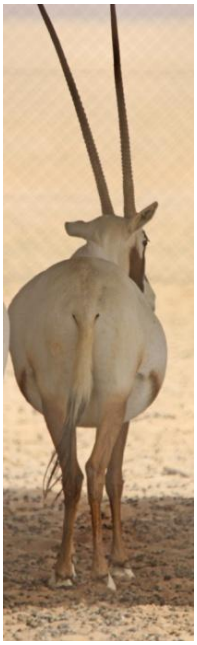


Figure 3 Left showing BCS =4, Right showing BCS = 5

3- Assess the hooks

- If the hooks are circular in outline……BCS=3
- Hooks are angular in outline……..(4)



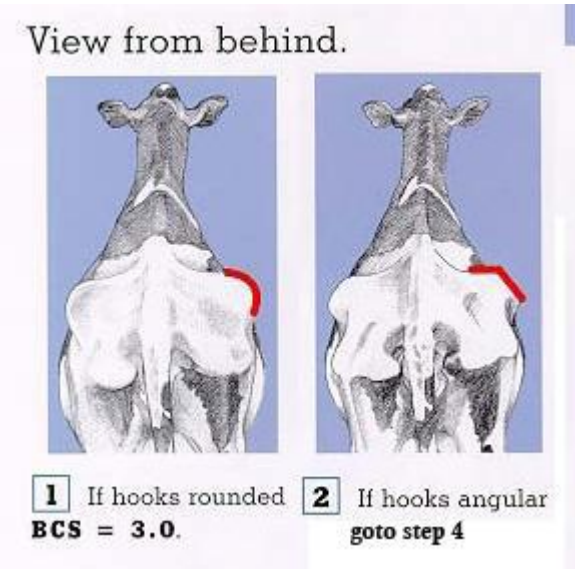


Figure 4 Assessment from behind

4- Assess the fat cover over the pins

- If the fat cover is poor and only upper pins are visible or slightly visible……BCS=2
- Fat cover over pins is poor and 2 pairs of pins are visible……..(5)

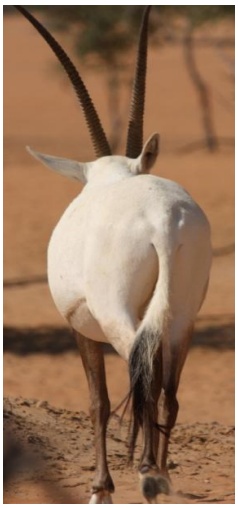


Figure 5 Assessing the fat cover over the pins

5- Assess the fat cover over the pins

- Spine showing, 2 pairs of pins visible and shallow groove around tailhead ligament but caudal vertebrae not visible……..BCS=1
- Spine strongly visible, 2 pairs of pins prominently visible, deep grooves a round tailhead ligament, and caudal vertebrae are ……..BCS=0

Feeding Points

Initially the reserve had 6 feeding stations, for the reserve to accomplish the predetermined BCS an extra 8 feeding stations would be implemented into the reserve. See below Figure 1 showing the old and the new feeding stations for the Dubai Desert Conservation Reserve (D.D.C.R).

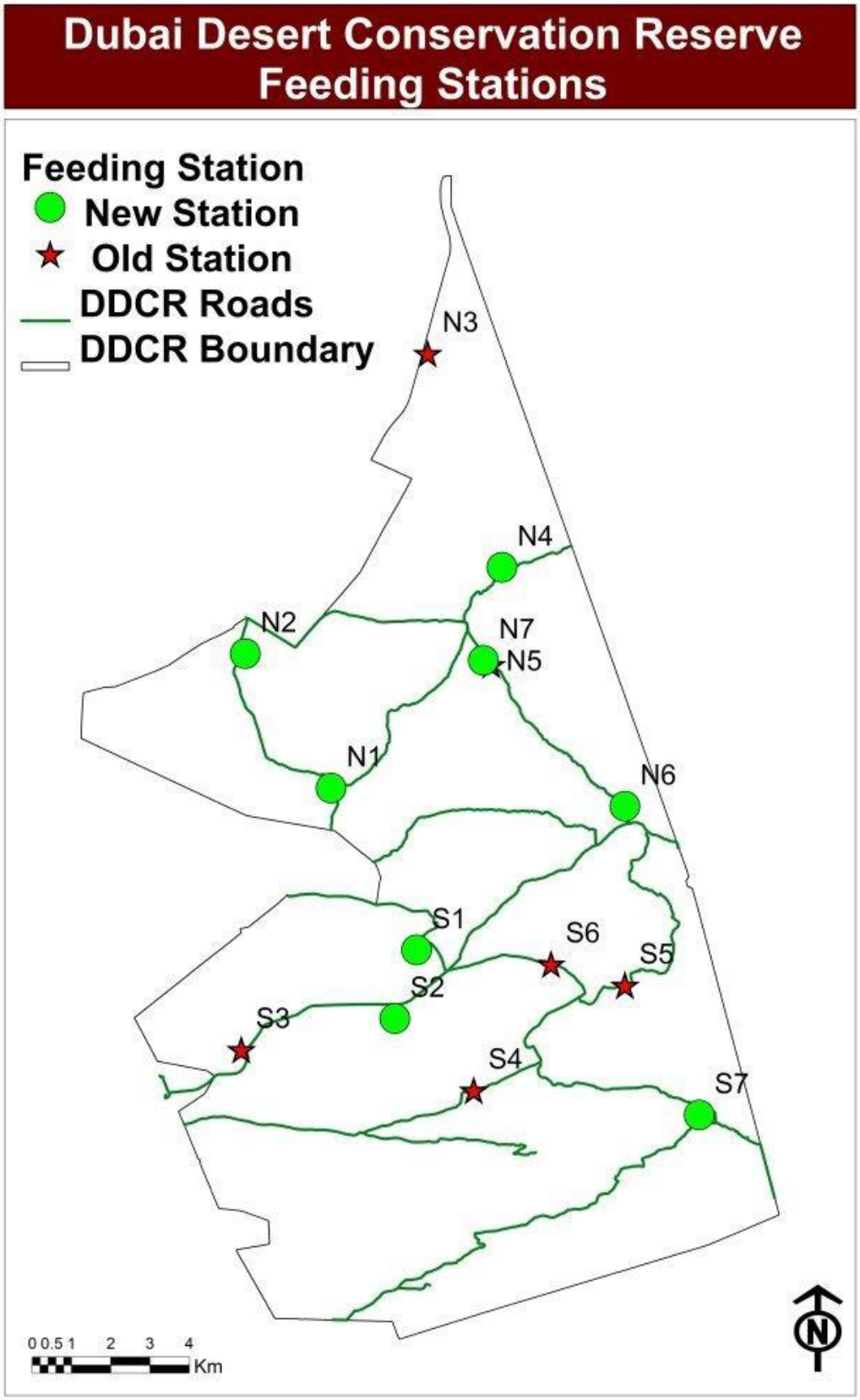


Figure 6 Map showing old and new feeding stations

Feed Supplementation

Before the survey started feeding of Alpha alpha was 230 bundles which has been increased to 342 bundles a day, game pellets 75kg to 158kg. In addition to this 153kg of Zebeel B-Mix feed was introduced which is a general camel feed.

Table 1 Feeding quantities for each site

				Old feeding program		New feeding program			Daily Requirements		
Feed Point	X	Y	Oryx	Alpha-alpha Bundles	Game Pellets Kg	Alpha-alpha Bundles	Game Pellets Kg	Zabeel Feed Kg	Alpha-alpha Bundles	Game Pellets Kg	Zabeel Feed Kg
S1	55.65383	24.81812	22	10		18	10	10	22	12	12
S2	55.64886	24.80238	29	20		30	17	17	29	16	16
S3	55.61364	24.79528	16	15	12.5	17	9	9	16	9	9
S4	55.66695	24.78595	20	14	12.5	17	9	9	20	11	11
S5	55.7016	24.81005	18	15	12.5	19	10	10	18	10	10
S6	55.68468	24.8149	21	15	12.5	20	11	11	21	12	12
S7	55.71865	24.78027	18	8		18	10	10	18	10	10
Other				35		37			37		
N1	55.63423	24.85523	19	11		15	8	8	19	10	10
N2	55.61454	24.88607	22	15		26	14	14	22	12	12
N3	55.65639	24.95494	20	12	12.5	22	12	12	20	11	11
N4	55.67341	24.90588	13	9		17	9	9	13	7	7
N5	55.67099	24.88359	26	25	12.5	35	19	19	26	14	14
N6	55.7016	24.85107	19	9		16	9	9	19	10	10
N7	55.66915	24.88454	16			20	11	11	16	9	9
Other				17		15			15		
TOTAL			**279**	**230**	**75**	**342**	**158**	**158**	331	153	153
Total Dry Matter Fed per day					**305**			**658**			**638**

Daily Intake (kg)	Alpha-alpha Bundles	Game Pellets Kg	Zabeel Feed Kg
2.1	1	0.55	0.55

Results

Table 2 Average BCS between male & female over the 3 months of survey

May 2013

Sites	♀	♂
S1	1.2	1.5
S2	1.4	1.25
S3	1.1	1.5
S4	0.8	1.2
S5	1.1	1
S6	0.7	1
S7	1.5	1.5
N1	0.9	1
N2	1.4	1
N3	1.4	1
N4	1.2	1.3
N5 & N7	1.2	1.8
N6	0.8	0.5
Avg. Scr.	1.1	1.2

June 2013

Sites	♀	♂
S1	1.1	2
S2	0.9	2
S3	1.9	2
S4	1	2.2
S5	1.8	1.4
S6	1.6	2
S7	1.9	1.8
N1	1.1	1.3
N2	1.8	2.5
N3	1.6	1.7
N4	1.7	1.8
N5 & N7	1.7	2.3
N6	1.5	1.5
Avg. Scr.	1.5	1.9

July 2013

Sites	♀	♂
S1	2.1	1.8
S2	2.1	2.4
S3	2.1	2
S4	1.9	2.3
S5	2.0	2
S6	2.4	3
S7	1.5	2.2
N1	1.9	2.7
N2	2	2.5
N3	2.1	2.3
N4	1.9	2.1
N5 & N7	2.1	2.2
N6	1.9	2.5
Avg. Scr.	2.0	2.3

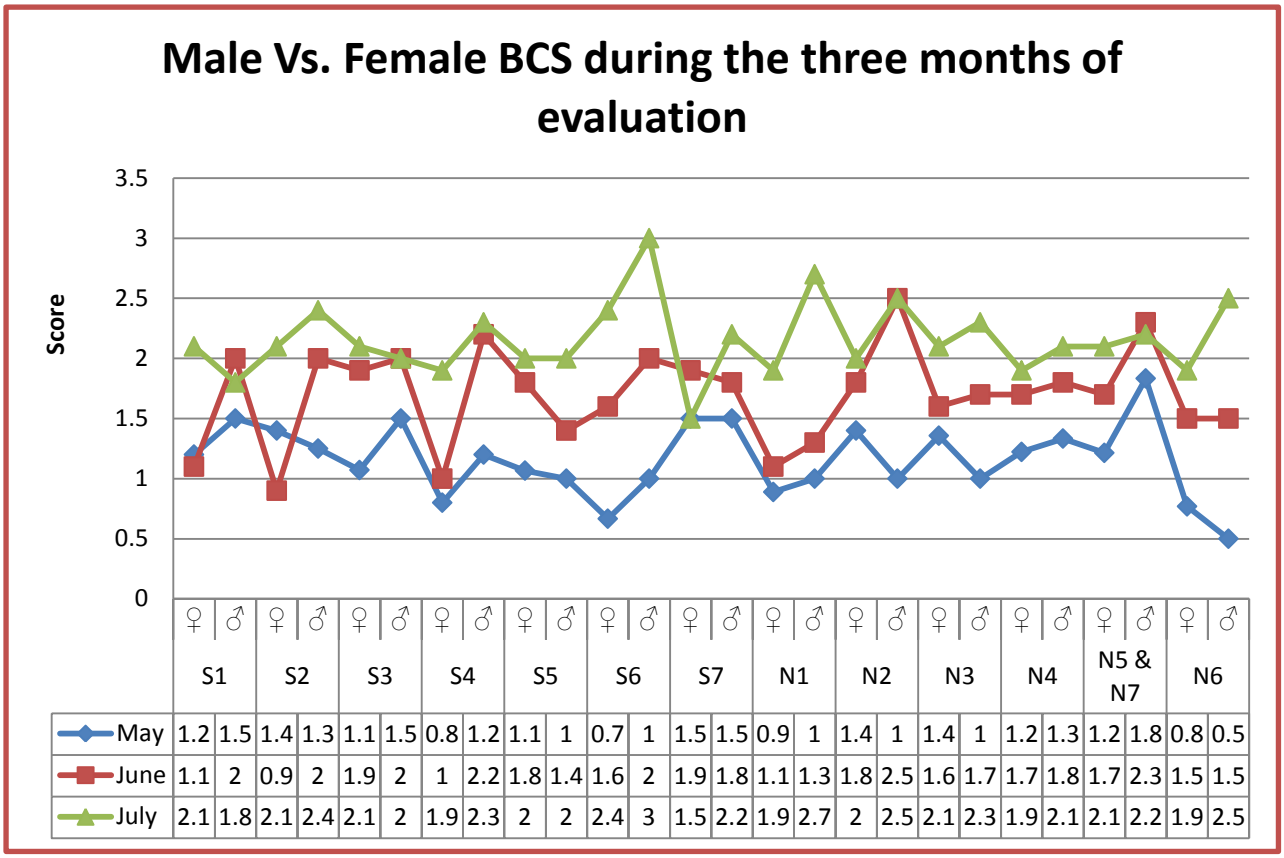


Figure 7 Showing the BCS increase over the 3 months

Table 3 Average score for each herd

Month	Site	Site	Site	Site	Site	Site	Site	Site	Site	Site	Site	Site	Site
	N1	N2	N3	N4	N6	N5 & N7	S1	S2	S3	S4	S5	S6	S7
May-13	0.9	1.5	1.1	1.2	0.6	1.2	0.8	1.3	1.2	1	1	0.8	1.5
Jun-13	1.2	1.9	1.6	1.7	1.5	1.9	1.4	1.4	1.8	1.3	1.6	1.6	1.8
Jul-13	2	2.1	2.1	2	2.1	2.2	2	2.1	2	2	2	2.4	1.7

Finial BCS at the end of each month of assessment

May 2013 Average Body Condition Score = 1.1

June 2013 Average Body Condition Score =1.7

July 2013 Average Body Condition Score = 2.2

Feed supplementation figures

- Alpha alpha feed a 67% increase
- Game Pellet a 47% increase
- Zabeel B-Mix Camel feed – new additional supplement

Table 4 Composition of Zabeel feed mix

Camel Feed		B-Mix	INGREDIENTS
Crude Protein	%	13.0	Barley
Crude Fat	%	4.1	Oats
Digestable Energy	MJ/kg	13.0	Soyabean Meal
Starch	%	37.1	Sorghum
NDF	%	22.5	Wheaten Chaff
ADF	%	10.5	Lupins
Ash	%	7.1	Fine Bran
Calcium	%	1.0	Maize
Phosphorus	%	0.5	Limestone
Magnesium	%	0.3	Vit & Min Premix
Sodium	%	0.4	Soya Oil
Copper	mg/kg	33.3	Purified Molasses
Zinc	mg/kg	63.9	DCP
Iodine	mg/kg	2.8	Salt
Iron	mg/kg	157	Rumen Buffer
Manganese	mg/kg	75.3	Mycotoxin Absorbent
Selenium	mg/kg	0.35	Live Yeast Culture
Vitamin A	IU/kg	5047	Selenium
Vitamin D3	IU/kg	279	Copper
Vitamin E	mg/kg	109	
Vitamin B1	mg/kg	11.1	
Biotin	µg/kg	149	

Discussion

Monitoring programmes should address the trends in the Arabian Oryx (*Oryx leucoryx*) populations over time and the heterogeneity of their distribution.

Male vs. Female

Average body condition scores between male and female over the period of the survey showed that female condition scores were lower than that of the males, which is due to the strains the female endures during pregnancy as the majority of females were pregnant during this time (See table 2). Between May and July 2013 you can see a clear increase in Body condition scoring in both male and female Oryx. In May the male score were 1.1 and the females were 1.2 which represents a thin population. This figure was expected as the new feeding programme had just been implemented and the expected outcome of the new feeding programme would only start showing the benefits by the end of the 2nd month (June).

Male figures for June were 1.9 and females 1.5 which was a slight increase compared to the previous month. The BCS still represented a thin population. The scores at the end of the survey showed that the males were 2.3 and the female a 2 which represents malnutrition amongst the population.

Average herd scores

Herd scores for the 3 months of the survey show a lower BCS than one would expect. As this is an average there will always be members in the group that bring the herd average down (See table 3). May = 1.1, June = 1.7, July = 2.2. Although there is a clear increase in BCS between May and July the figure are still low. By continuing this feeding programme to November 2013 the scores should be around 3 which represent a fit and healthy population. One does not want all the Oryx in the reserve to represent a 3 as this is unnatural and would not benefit the dynamics of the herd.

Recommendations for action and further studies

I would recommend the continuation of the feeding programme by November 2013 the scores should be around 3 which represent a fit and healthy population. One does not want all the Oryx in the reserve to represent a 3 as this is unnatural and would not benefit the dynamics of the herd. At the end of February one should revaluate the BCS of the Arabian Oryx.

There is no need for a further increase in feed supplementation and the DDCR can continue with the current feeding programme. If one would increase the feed the DDCR would be at risk of having fat and obese Oryx over time, which will not benefit the Oryx population of the reserve.