

GRIZZLY BEAR (*URSUS ARCTOS*) DIET MANAGEMENT: SEASONAL DIETS TO ATTAIN HEALTHY WEIGHT

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Abstract

Grizzly bears (*Ursus Arctos*) are specially adapted to survive the changing seasons of northern latitudes through changes in metabolism and behavior: In the zoo environment, these adaptations make weight management a challenge (Watts, 2009). Wild bears pack on the pounds during warm months to ensure they can survive the winter's harsh weather and scarcity of food - losing as much as one-third of their body weight during hibernation (Robbins *et al.*, 2005; Kingsley *et al.*, 1983). At San Diego Zoo, the grizzly bears still pack on the pounds in warm months, but their winter isn't so harsh, and in the past, food has been plentiful, resulting in bears that were overweight all year round. In January 2016, Nutritional Services and Animal Care Staff at San Diego Zoo partnered to develop a year-long diet plan that included seasonal shifts in when food energy is offered to bears and selection of dietary items with lower caloric density. Our goal was to encourage more appropriate seasonal fluctuations in body condition and body weight. Given their unique biology, success of the program could not be assessed until 1 year later: Through caloric restriction in the winter and spring of 2016 and 2017, we were able to attain seasonal changes in body weight of approximately 40 kg (15% of BW; double previous years). Efforts have continued in 2017 with a refined process and hopes for further success in weight management tailored to these seasonal animals.

Literature Cited

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- Robbins CT. 2005. Nutritional ecology of North American bears. In Graffam W, Hellinga D, Maslanka M, and Ward A, Eds. *Proceedings of the Sixth Conference on Zoo and Wildlife Nutrition*, AZA Nutrition Advisory Group, Omaha, NE.
- Watts J (2009) Case study: Seasonal diets for brown bears (*Ursus arctos*) at Brookfield Zoo: successful implementation led to reduced weight and improved behavior. In Ward A, Treiber K, Schmidt D, Coslik A, and Maslanka M, Eds. *Proceedings of the Eighth Conference on Zoo and Wildlife Nutrition*, AZA Nutrition Advisory Group, Tulsa, OK.

Table 1. Composition of diet (% As-Fed) offered to grizzly bears (*Ursus arctos*) at San Diego Zoo in 2015.

Item ¹	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Extruded Dry Diet	%					1	5	5	5	5	5	2	
Raw Meat Items	%	15	18	33	36	36	37	38	38	37	37	37	20
Whole Prey	%	6	6	5	4	4	6	5	5	7	7	5	5
Produce	%	78	76	62	60	58	52	53	53	51	51	56	75

¹Extruded Dry Diet = Omnivore Diet (Mazuri #5635); Raw Meat Items = commercial raw meat diets, muscle meats, organ meats, and meat on bone; Whole Prey = whole rabbit and fish; Produce = greens, vegetables and fruit

Table 2. Composition of diet (% As-Fed) offered to grizzly bears (*Ursus arctos*) at San Diego Zoo in 2016.

Item ¹	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Extruded Dry Diet	%						2	3	4	8	6		
Raw Meat Items	%	20	19	20	21	24	25	25	25	27	30	34	21
Whole Prey	%				3	8	7	7	7	6	9	7	4
Produce	%	80	81	80	75	67	64	63	62	58	53	57	73
Cellulose	%				1	2	2	2	2	2	1	2	1

¹Extruded Dry Diet = Omnivore Diet (Mazuri #5635); Raw Meat Items = commercial raw meat diets, muscle meats, organ meats, and meat on bone; Whole Prey = whole rabbit and fish; Produce = greens, vegetables and fruit

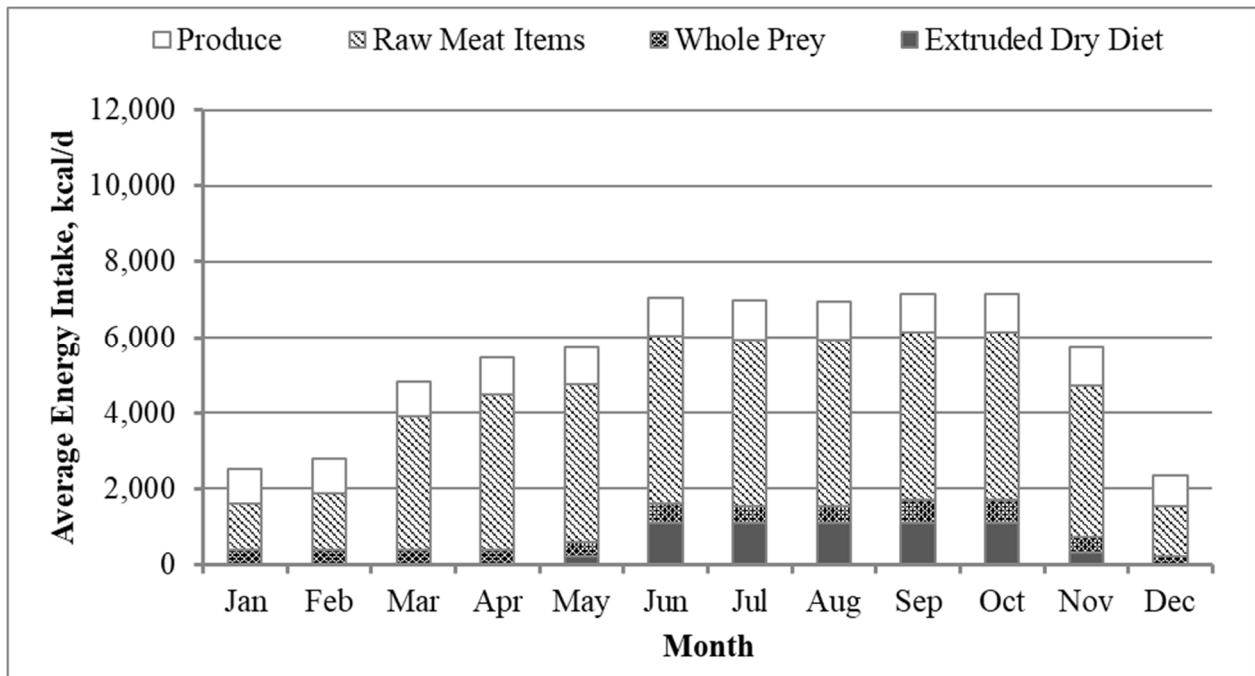


Figure 1. Average energy intake (kcal/d) of male grizzly bears (*Ursus arctos*) housed at San Diego Zoo in 2015.

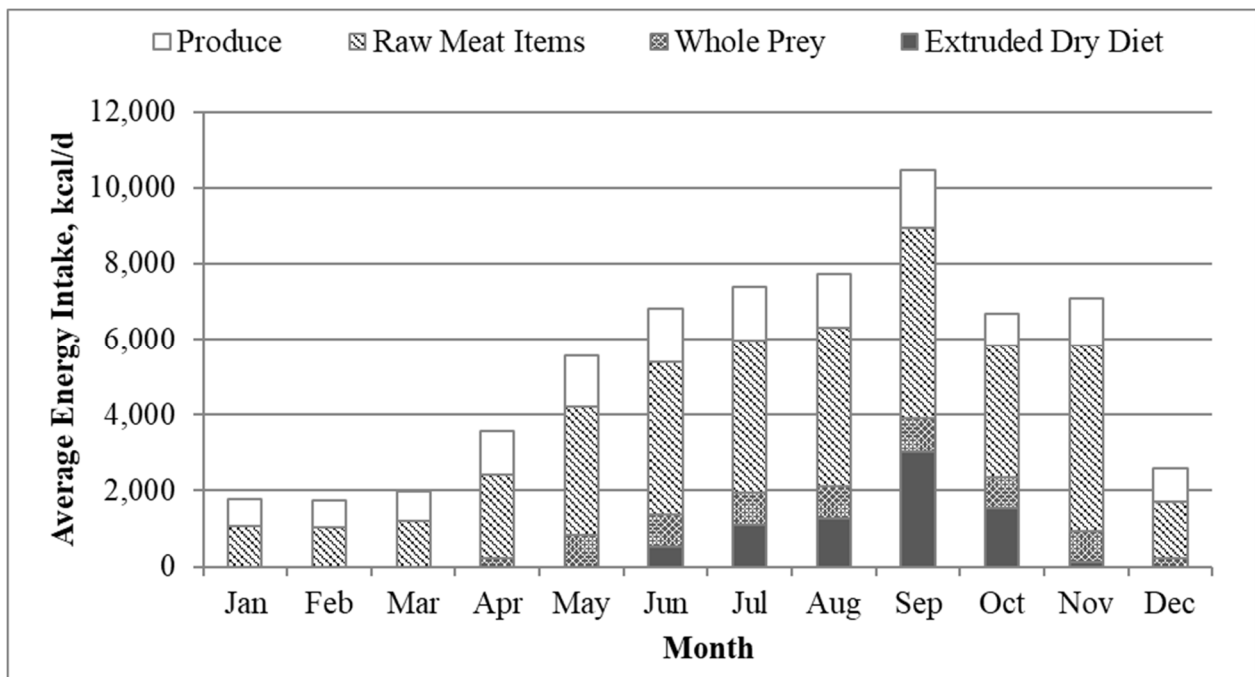


Figure 2. Average energy intake (kcal/d) of male grizzly bears (*Ursus arctos*) housed at San Diego Zoo in 2016.

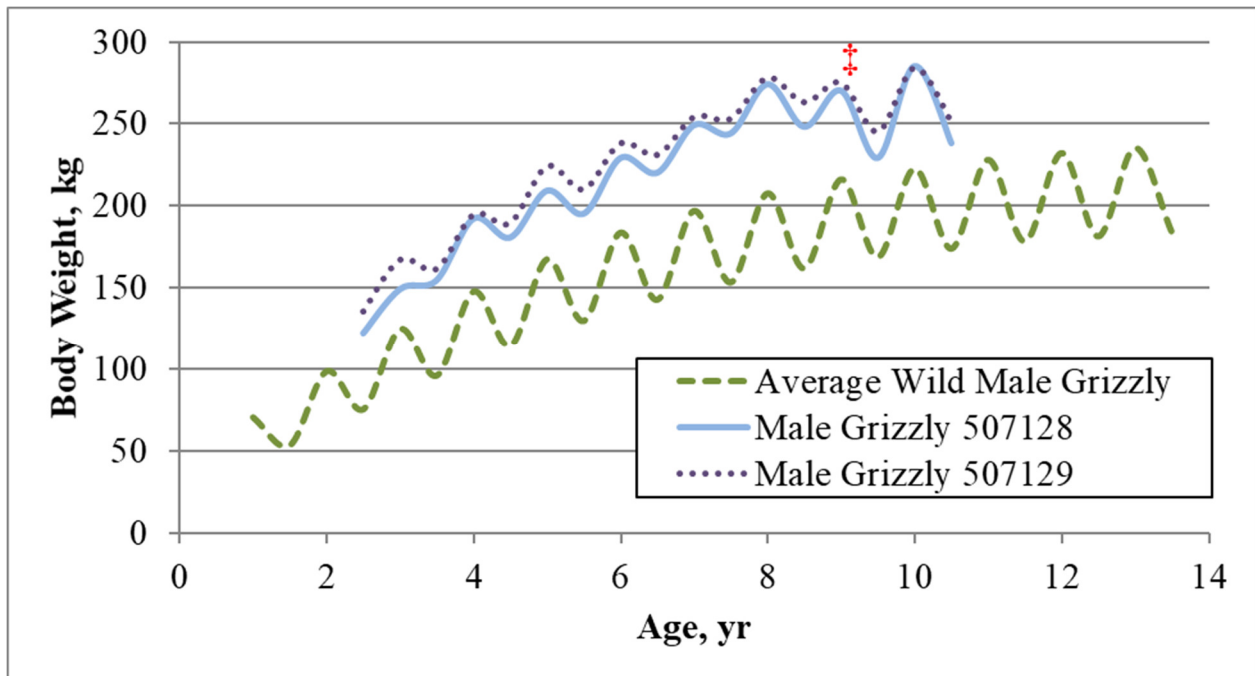


Figure 3. Growth of male grizzly bears (*Ursus arctos*) housed at San Diego Zoo compared to values adapted from Kingsley *et al.* (1983) for *in situ* male grizzly bears from northern Canada. Initiation of diet management change denoted by: †.

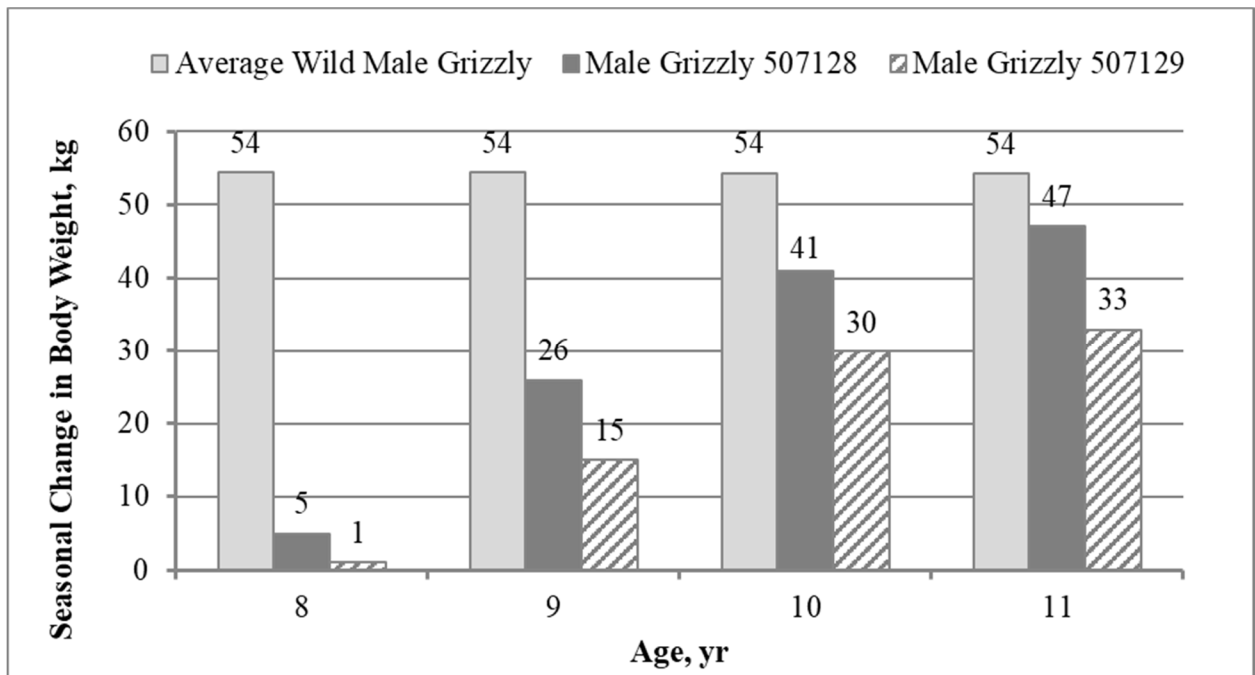


Figure 4. Seasonal change in body weight (kg, fall to spring) of male grizzly bears (*Ursus arctos*) housed at San Diego Zoo compared to values adapted from Kingsley *et al.* (1983) for *in situ* male grizzly bears from northern Canada. Dietary management change implemented from 10 to 11 y-old.