

Diet form dramatically alters motivation, enrichment device use and podomandibulation time in captive orange-winged Amazon parrots (*Amazona amazonica*)



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INTRODUCTION

About 2.7 million large parrots are kept as companion animals in the USA costing bird owners \$1.4 billion/yr for care^{1,2}. Unfortunately, items purchased for care (e.g., food, enrichment devices) may often be designed more for their appeal to owners rather than their appeal to birds³. If parrots are kept in austere environments natural foraging behavior may not be expressed, possibly resulting in abnormal behavior and poor welfare⁴. Because captive parrots experience distinctly different foraging options than their wild counterparts, we sought the following objectives:

Podomandibulation

The coordinated use of the foot and mouth to manipulate items



OBJECTIVES

- to characterize feeding behavior of captive Amazon parrots fed a traditional pelleted diet, particularly in regard to meal patterning and activity budget;
- to determine the effect of pellet size/shape on feeding behavior, meal patterning and activity budget;
- to determine if parrots prefer one pellet type over another;
- to determine the motivation (i.e., maximum price) for alternative pellet types when regular pellets were freely available;
- to determine the motivation for two alternative pellet types when the opposite size was freely available;
- to determine whether parrots were motivated to perform a task for pellet resources and to determine the maximum price for wooden cube enrichment device access when either regular or over-sized pellets were freely available

METHODS

Meal Patterning/Activity Budget

- Regular pellet data (N=4);
- Over-sized pellet data (N=6)
- Cages were equipped with 4 pairs of IR-beam transmitters and receivers to monitor bird location. Video used to corroborate data
- 2-3 pairs of birds were monitored for up to 5 days during two periods: once when fed regular pellets and once when fed over-sized pellets
- Roudybush* low-fat maintenance formula used for all pellets

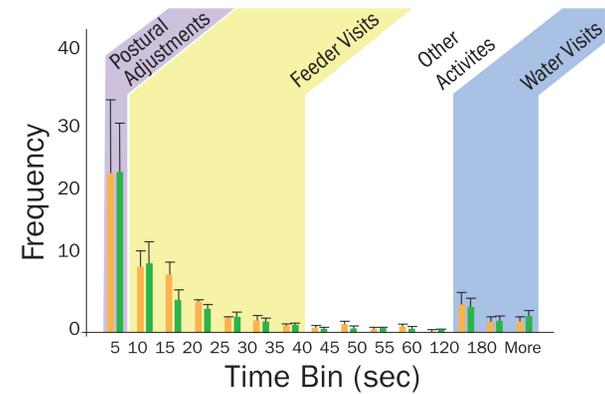


- Podomandibulation time determined by video with 10 retrievals / parrot / pellet type

RESULTS

Meal Patterning/Activity Budget

- Birds left their perch almost exclusively to feed or drink



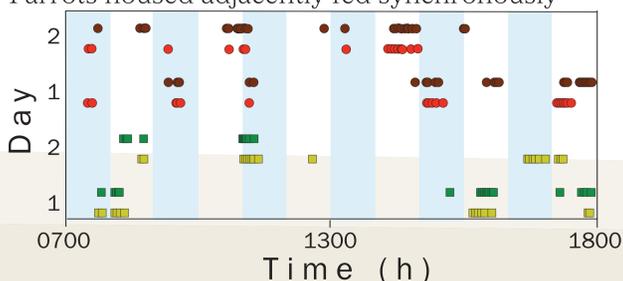
Pooled data +/- SE from Amazons fed regular or over-sized pellets

- Over-sized pellets increased podomandibulation time (P=0.003) and elongated meal cluster duration (P=0.0202)

thereby increasing captive foraging time:

Regular pellets = 43 min (5.9% of 12 h day)
Over-sized pellets = 3 h (25.7% of 12 h day)

- Parrots had distinct morning and evening feeding periods
- Meals were clustered within these periods
- Parrots housed adjacently fed synchronously



Feeder visit data of two pairs of birds fed regular pellets from two consecutive days. Each point represents one feeder visit.

Preference (N=12)

- Cages fitted with two adjacent feeders
- Birds provided with one of two pellet treatments for a 5-day period: Over-sized pellets (400 g) in one feeder and regular pellets (150 g) in the other; or only regular pellets (150 g) in one feeder. Then all birds received the opposite treatment.
- Repeated with pellet types in opposite feeder sides to ensure no side bias

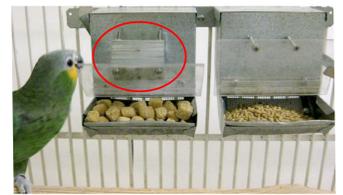


Enrichment Device Use

Same procedure as preference test but with addition of two 3.8 cm/side wooden cubes to cage for 3 days

Motivation (N=10)

- Hinged lids on same feeder apparatus allowed for addition of weights (up to 480 g)
- Over six 8-day trials (in addition to control) birds would lift the lid of the "closed feeder", which increased in weight each day (by ~63 g), for a pellet type/enrichment device resource, while a different pellet type was freely available in the "free feeder"
- Tested resources included combinations of: regular, over-sized and large-sized pellets
- Podomandibulation time determined by visual observations of 3 retrievals / parrot / pellet type



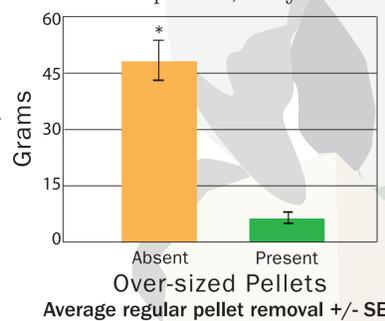
Parrot lifting 427g for access to over-sized pellets

Enrichment Device Use

Two 8-day trials. Same procedure as motivation test but with ten 2.5 cm/side wooden cubes in the "closed feeder" and either regular or over-sized pellets in the "free feeder"

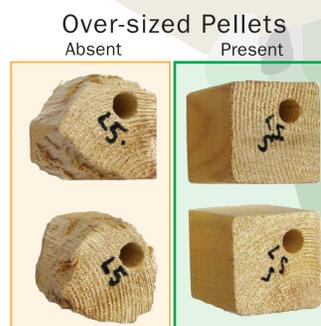
Preference

- Parrots preferred over-sized pellets; they removed ~41g more regular pellets in the absence of over-sized pellets (P<0.0001)
- Parrots chose over-sized pellets more often (P=0.0002)



Enrichment Device Use

- Parrots used wooden cubes more in the absence of over-sized pellets (P=0.0018)
- Presence of wooden cubes did not effect pellet removal (reg. P=0.2494; over-sized P=0.2009)



Motivation

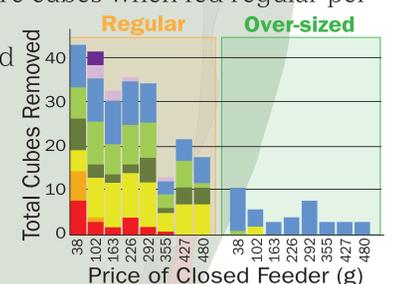
- When regular pellets were freely available, 7/10 birds lifted maximum weight for either over-sized or large-sized pellets; no difference in maximum price (P=0.1710)
- Birds lifted ~243 g more for over-sized pellets when large-sized pellets were freely available (P=0.0055) than vice versa
- No evidence of contrafreeloading on pellet choice (P<0.0001) and no effect of weights vs no weights on lid (P=0.5768)



Working for over-sized or large-sized pellets when regular pellets are freely available

Enrichment Device Use

- Birds removed more cubes when fed regular pellets; 243 compared to 41 (P=0.0078) and lifted an average of 221 g more for cubes when fed regular pellets, compared to over-sized (P=0.009)



Cubes removed from closed feeder when fed either regular or over-sized pellets. Each color represents an individual bird.

CONCLUSIONS

- Captive Amazons rarely leave their perch
- Over-sized pellets naturalize foraging time from 43 min to 3h
- Amazons prefer and are motivated for larger pellets than what is commercially recommended for birds of their size
- Interaction with wooden cube enrichment devices is identical to podomandibulation of food
- Wooden cube destruction/motivation in absence of over-sized pellets suggests an appetite for manipulation
- Destructible enrichment devices may be a foraging surrogate

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CITATIONS

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