

POUCH CAPACITY OF COOPER'S CHIPMUNKS

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Cooper's chipmunks (*Eutamias townsendii cooperi*) are frequently observed with their cheek pouches stuffed with food. I have often wondered how much food their pouches would hold. No volume measurements were found in the literature for *Eutamias*, but several references listed the food items eaten. However, because of the variability in the size of the same food item, it is not possible to relate the enumerations to volume. During 1961, while live trapping small mammals on the H. J. Andrews Experimental Forest, Linn and Lane counties, Oregon, some information on pouch contents was secured.

Live-trapped chipmunks frequently have their pouches loaded with oats and wheat. They are reluctant to discharge the food unless agitated or handled excessively. Food items can be palpated in the pouches or observed by pulling outward on the corners of the mouth. By pushing forward on the pouches with the fingers, one can remove the food with tweezers without hurting the animal. The contents and volume of the pouches of five live-trapped Cooper's chipmunks are as follows:

Date	Sex	Est. Age	Item	Number Seeds	Volume* cc.
May 28	m	Adult	Oats	29	1.8
			(<i>Avena sativa</i>)		
			Oat groats	3	
			Wheat	2	
May 28	m	Adult	(<i>Triticum aestivum</i>)		3.7
			Oats	54	
			Oat groats	21	
			Wheat	2	
Sept. 11	m	Immature	Oats	37	2.1
			Oat groats	1	
Sept. 24	m	Immature	Cinnamon bush	1,091	4.8
			(<i>Ceanothus velutinus</i>)		
Sept. 24	f	Adult	Oats	108	6.0
			Oat groats	5	
			Vine maple	2	
			(<i>Acer circinatum</i>)		
			Cinnamon bush	15	

* Air-dried items measured in a graduated cylinder.

The maximum capacity indicated in the above data for the pouches of a Cooper's chipmunk is 6.0 cc. Anthony (1928) gives measurements which suggest the Cooper's chipmunk is about the same size as Lyster's chipmunk (*Tamias striatus lysteri*). Audubon and Bachman (1849) found at least one and one-half tablespoons of bush trefoil (*Hedysarum cannabinum*) seed in the sacks of a Lyster's chipmunk from Pennsylvania. Klugh (1923) reported the pouches of the same species from Lake Missanag, Ontario, Canada, would hold 31 large kernels of corn equal to two heaped-up tablespoons. Since a level tablespoon is equal to about 17 cc., the Lyster's chipmunk must have much larger pouches than the Cooper's or my data do not approach the capacity of the animal. However, there could be considerable individual variation in the pouch capacity of chipmunks.

The chipmunk which had 1,091 cinnamon bush seeds is of particular

interest. It had loaded its pouches with the seeds and then entered the live trap, presumably to secure some oats. Cinnamon bush is an important shrub on cutover forest lands in the Douglas-fir (*Pseudotsuga menziesii*) belt. It usually develops rapidly after an area is burned and forms a dense cover often detrimental to forest regeneration. The presence of the large number of cinnamon bush seeds in the pouches of a Cooper's chipmunk suggests it may be an important food item. In California, Tevis (1953) found white-thorn (*Ceanothus cordulatus*) seeds to be the major chipmunk food for one and one-half months.

When alarmed, live-trapped Cooper's chipmunks often start unloading their pouches. It is difficult to determine just how they expel the food. I have observed a movement of the mouth and tongue which causes the seeds to tumble out in an uneven dribble. Broadbooks (1958) made similar observations for *Eutamias amoenus* in eastern Washington. He noted that it often took several minutes before the last seed was discharged. Schwartz and Schwartz (1959) reported the eastern chipmunk (*Tamias striatus*) squeezed out its pouches with a back-to-front motion of the front feet. The Cooper's chipmunks may also use their feet, although I have not observed this process.

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