



What Does a Sage-Grouse Eat?

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Introduction

Greater sage-grouse (*Centrocercus urophasianus*; sage-grouse), as their name implies, depend on sagebrush (*Artemisia* spp.) for their survival. In fact, during the winter sage-grouse survive by only eating sagebrush.



Sage-grouse female eating black sagebrush (A. nova) during the winter. Photo courtesy of Todd Black.

People often refer to sage-grouse as being chicken-like. Other than a similar shape and feathers, the comparison really ends there. They do not have a muscular gizzard which uses grit (e.g., gravel) to grind up their food like the domestic chicken or other upland gamebirds, thus they cannot eat seeds. Sage-grouse have a unique digestive system which separates the toxins (i.e., terpenes which give sagebrush its distinctive odor) from sagebrush leaves.

However, during the spring, summer, and fall sage-grouse may eat a variety of shrubs, forbs (“flowers”), and grasses as well as animal (mostly insects) matter. We researched available scientific literature and combined information to see what sage-grouse eat based

on examining the contents of sage-grouse crops, the digestive tract storage area located immediately behind the throat. We looked at juvenile grouse (<16 weeks old) separately from adult grouse (>16 weeks old). We reviewed our collected data and separated what sage-grouse eat based on seasons; winter (November-March), spring (April-May), and summer/fall (June-October). For juvenile sage-grouse diets we used three age-specific periods since hatch: 1-3 weeks, 4-10 weeks, and 11-16 weeks. We then averaged percent volume of sagebrush, forbs, grasses and insects by period. Because the studies did not define age-classes consistently; e.g., one had 1-2 weeks and another 1-3 weeks, we combined their reported information as best as possible to identify some general patterns.

So, what do sage-grouse eat and when?

We found that commonly consumed forbs include dandelion, daisy, clover, goatsbeard, burclover, vetch, and phlox, although many other forbs can be eaten (Table 1). Insects readily eaten include grasshoppers, beetles, moths and butterflies, and ants. What they eat also changes as they age. Juvenile and adult sage-grouse may eat different amounts of plant and animal matter at different times of the year (Figures 1, 2).

Adult sage-grouse eat nearly 100% sagebrush during the winter (November to the beginning of March; Figure 1). During the spring and summer they eat more forbs (i.e., broad-leaved green plants) and insects (Figure 1). Grasses are only a minor food item in any season. Then between October and November they switch back to an almost entirely sagebrush diet (Table 2).

Sage-grouse chicks require forbs and insects for growth. The high protein content in insects is critical the first few

weeks of life. Sage-grouse chicks usually hatch from late May to early June. The need for forbs seems to increase through the summer, as the percent of insect matter they eat decreases as they grow older (Figure 2). They begin eating sagebrush after 4 weeks of age. By November, their diet matches that of adult sage-grouse (Table 3). However, in areas where more forbs are available, they may continue to prefer forbs to sagebrush.



A sage-grouse adult female foraging during the summer. Photo courtesy of Lester Flake.

Table 1. List of forbs used as food by sage-grouse.

Note: This list is not necessarily comprehensive.

Common Name	Scientific Name
Pussy toes	<i>Antennaria</i> spp.
Phlox	<i>Phlox</i> spp.
Milkvetch	<i>Astragalus</i> spp.
Hawksbeard	<i>Crepis</i> spp.
False dandelion	<i>Agoseris glauca</i>
Common dandelion	<i>Taraxacum officinale</i>
Desert parsley	<i>Lomatium</i> spp.
Arrowleaf balsamroot	<i>Balsamorhiza</i> spp.
Buckwheat sp.	<i>Eriogonum</i> spp.
Common yarrow	<i>Achillea</i> spp.
Common salsify	<i>Tragapogon</i> spp.
Sego lily	<i>Calochortus</i> spp.
Prickly lettuce	<i>Lactuca</i> spp.
Lupine	<i>Lupinus</i> spp.
Daisy	<i>Erigeron</i> spp.
Clover	<i>Trifolium</i> spp.
Burclover	<i>Medicago polymorpha</i>

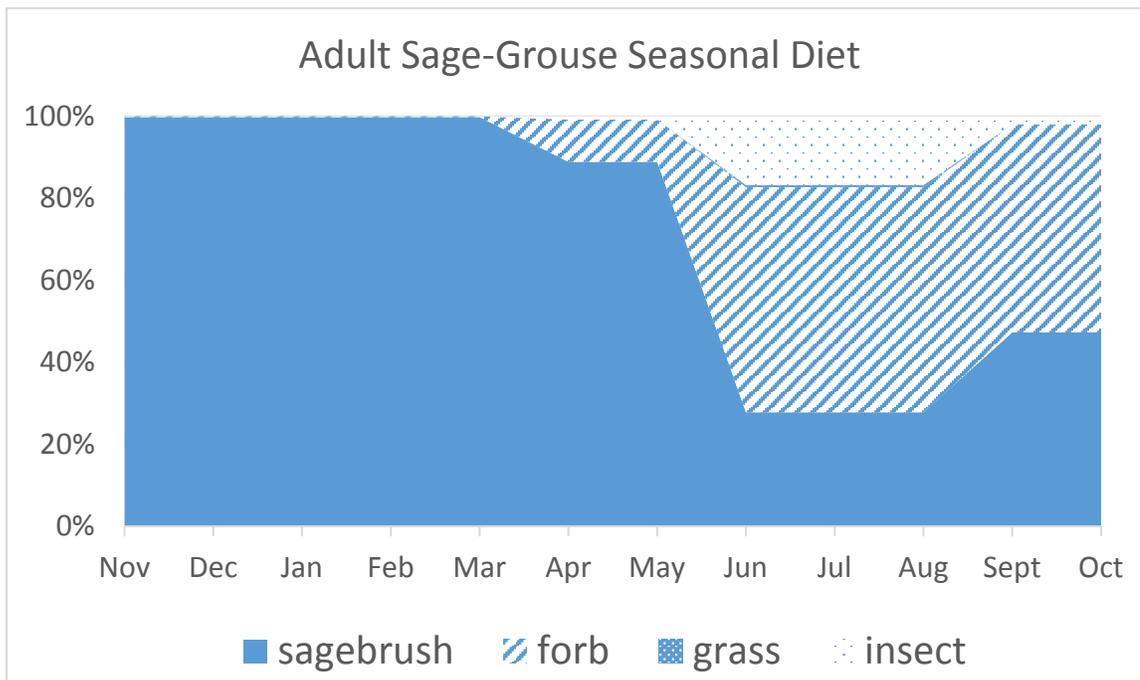


Figure 1.

Table 2. Range of percent volume of food items seasonally for adult sage-grouse.

	Winter (Nov-Mar)	Spring (Apr-May)	Summer (Jun-Aug)	Fall (Sep-Oct)
Sagebrush	98-100	87-90	5-45	3-81
Forb	0-2	6-12	33-59	19-80
Grass	n/a	n/a	0-2	n/a
Insect	n/a	0-1	1-19	1-5

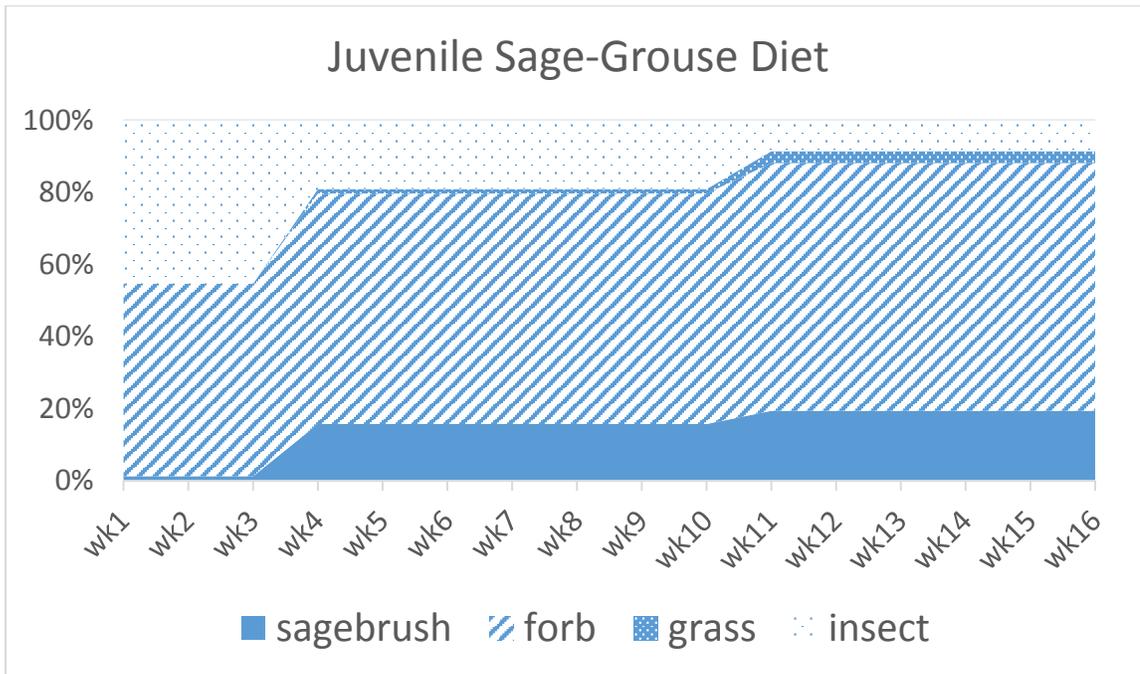


Figure 2.

Table 3. Range of percent volume of food items for each juvenile sage-grouse age group.

	1-3 weeks	4-10 weeks	11-16 weeks
Sagebrush	0-4	1-47	2-47
Forb	20-77	22-82	22-95
Grass	n/a	0-3	3-6
Insect	23-67	8-25	3-17

So, why is knowing what sage-grouse eat important?

Although sage-grouse may eat only sagebrush during the winter, knowing that they need to eat other foods at other times of the year helps wildlife managers implement projects that will ensure a balanced diet. For example, during the summer in many areas sage-grouse broods will seek out wet meadows with low sagebrush cover but high forb cover and insect populations. By knowing this, wildlife managers working with land-owners and manager can protect these areas and improve brooding habitat when needed. Additionally, recent research in Utah showed that black sagebrush (*A. nova*), when available, can be an important winter food for greater sage-grouse. By knowing what a sage-grouse eats and when, we can determine what we need to do to maintain and improve populations and their habitats.

Literature Cited

- Drut, M. S., W. H. Pyle, and J. A. Crawford. 1994. Diets and food selection of sage grouse chicks in Oregon. *Journal of Range Management* 47:90-93.
- Johnson, G. D., and M. S. Boyce. 1990. Feeding trials with insects in the diet of sage grouse chicks. *Journal of Wildlife Management* 54:89-91.
- Klebenow, D. A., and G. M. Gray. 1968. Food habits of juvenile sage grouse. *Journal of Range Management* 12:80-83.
- Patterson, R. L. 1952. *The sage grouse in Wyoming*. Sage Books, Denver, Colorado, USA.
- Peterson, J. G. 1970. The food habits and summer distribution of juvenile sage grouse in central Montana. *Journal of Wildlife Management* 34:147-155.
- Thacker, E. T., D. R. Gardner, T. A. Messmer, M. R. Guttery, and D. K. Dahlgren. 2012. Using gas chromatography to determine winter diets of greater sage-grouse in Utah. *Journal of Wildlife Management* 76:588-592.
- Wallestad, R. 1975. Life history and habitat requirements of sage grouse in central Montana. Game Management Division, Montana Department of Fish and Game, Helena, Montana