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FINAL REPORT

FEDERAL AID PROJECT W-142-R

FOOD HABITS AND NUTRITIONAL CONDITION OF WHITE-TAILED DEER AND CATTLE

AUGUST 1, 1986 thru SEPTEMBER 30, 1990

FINAL REPORT

STATE: OKLAHOMA PROJECT NUMBER: W-142-R

PROJECT TITLE: Food Habits and Nutritional Condition of White-tailed Deer and Cattle Under Varying Stocking Rates on Managed Forests

STUDY TITLE: Determination of Seasonal Food Habits and Nutritional Status of White-tailed Deer and Cattle in Relation to Cattle Stocking Rates on Managed Forests

PERIOD COVERED: 1 July 1986 to 30 September 1990

ABSTRACT

Dietary indices, fecal indices, and nutritional characteristics of collected white-tailed deer were used to assess effects of cattle stocking rates on the nutritional condition of deer in managed forests of southeastern Oklahoma. Three study areas were delineated that were similar in topographic, vegetational, and soil characteristics but varied from heavy to no cattle stocking. Seasonal collections were made of deer and cattle feces (Oct, Feb, May, and Aug) and deer (Feb and Aug) from 1986 to 1988 to assess dietary overlap, fecal nitrogen, fecal ribonucleic acid, and physical condition of deer in the 3 study areas. The percentage of conifer in winter deer diets tended to increase with increased cattle stocking, which suggested reduced diet quality during this season. Dietary overlap between cattle and deer was relatively low (<35%), but it was higher under heavy cattle grazing pressure than under moderate cattle grazing pressure. Fecal nitrogen was significantly lower ($P < 0.05$) in winter for deer populations exposed to cattle stocking than deer under no cattle stocking.

Carcass weights, femur fat, and reproductive rate were lower ($P < 0.05$) in winter for deer exposed to cattle stocking. Information on nutritional condition of deer during other seasons was not conclusive relative to effects of cattle stocking. Overall, our data suggest that heavy cattle stocking in McCurtain County, Oklahoma, negatively affected deer nutritional condition in winter.

REPORT CONTENT

I. JOB OBJECTIVES

1. Select and map 3 study sites on Weyerhaeuser Company property in southeastern Oklahoma and southwestern Arkansas that have cattle stocking rates from high to intermediate to zero.

2. Determine seasonal (4 times annually) food habits of white-tailed deer and cattle in 3 areas of differing stocking rates or cattle use.

3. Determine levels of fecal nitrogen (N) and fecal ribonucleic acid (RNA) in seasonal fecal collections for white-tailed deer and cattle to index nutritional condition.

II. INTRODUCTION

White-tailed deer (*Odocoileus virginianus*) and cattle coexist in southeastern Oklahoma on forested lands that are dominated by short-leaf pine (*Pinus echinata*) and oak (*Quercus* spp.). Conversion of climax pine-oak forest to loblolly pine (*Pinus taeda*) plantations by clearcutting large forested tracts results initially in growth of forb, grass, and browse species that can be utilized by both deer and cattle. Competitive interactions between these species may occur as plantations age and forage availability declines. Nelson (1984) studied habitat use by deer and cattle in southeastern Oklahoma, but she provided only limited information on competitive interactions between the species. Information on dietary habits, fecal indices, and nutritional condition of deer in managed pine plantations and under the effects of varied cattle stocking rates also is limited. We determined dietary overlap, fecal N and fecal RNA of sympatric deer and cattle and determined nutritional condition of deer collected from study areas that varied in cattle stocking rate from nonexistent to heavy year-round grazing.

III. METHODS

Study Sites

Information on soil classification (Crow 1974, Jenkins and Steinbrenner 1981, James 1982), vegetational composition (determined using dot grids on stand maps supplied by the Weyerhaeuser Company), and number of grazing permits (L. Creacy, Weyerhaeuser Company, pers. comm.) issued by the Weyerhaeuser Company was collected to delineate study areas. This information also was used to delineate similar but disjunct habitat blocks within each study area for collecting deer and cattle feces.

Food Habits

From October 1986 to October 1988, we made 9 trips to the 3 study areas in southeastern Oklahoma and southwestern Arkansas to collect deer and cattle feces for microhistological analyses. Feces were collected seasonally (i.e., fall [Oct], winter [Feb], spring [May], and summer [Aug]). Fresh fecal material was located in each study area by searching roads in habitat blocks for deer sign (e.g., tracks). Random transects were walked in pine plantations and natural vegetation surrounding locations containing deer sign.

Reference Material--Plant material (leaves, stems, and fruit) was collected for use as comparative reference material for the identification of plant fragments in deer and cattle feces. Plant material was dried in a plant press, identified to species, and a subsample was soaked in 95% alcohol for 1 week to remove plant pigments, rinsed, and soaked in lactophenol blue for a second week to stain and preserve plant fragments (Davitt and Nelson 1980). Subsamples were then blended in 200 ml of distilled water and pieces of leaf, twig and fruit epidermis transferred to slides, dried by placing slides on a hot plate, and permanently mounted in glycerin gel.

Fecal Material--Fecal samples were dried in a forced air oven (50 C) and individually blended. Feces were then composited by habitat block and season by hand mixing 1 $\pm$0.01g

of each individual fecal sample collected in the block (Jenks et al. 1989). Subsamples of composited feces were prepared for determination of dietary composition using the same procedures as for reference material to ensure that fragments in fecal material would semble reference material (Davitt and Nelson 1980). A 1-g subsample of blended feces was soaked in 95% alcohol for 1 week to remove plant pigments, rinsed, and soaked in lactophenol blue for a second week to stain and preserve plant fragments. Subsamples were then blended in 200 ml of distilled water and transferred to slides (4 slides/composite), dried by placing slides on a hot plate, and permanently mounted in glycerin gel.

Percent dietary composition of composited fecal samples was determined by randomly locating 100 microscope fields (25 fields per slide), identifying plant fragments within the field at 100-400X by comparing fecal plant fragments with specimens in the reference collection, and counting the number of square microns (at 100X) of each plant fragment. Percent plant species composition was then calculated by summing the total number of square microns per plant species and dividing by the total number of square microns counted per composited sample.

Fecal Indices

Fecal N of collected samples was determined using the Kjeldahl method (Williams 1984). Percent nitrogen was determined using a sulfuric acid digestion on duplicate 0.25g samples of composited feces that had been ground through a 1-mm mesh screen (Jenks et al. 1989). If duplicates differed by more than 5%, data were discarded and percent nitrogen determined on 2 new subsamples. Ribonucleic acid concentrations were determined on triplicate 0.4g subsamples of ground (i.e., 1-mm mesh screen), composited feces using a perchlorate digest with $AgNO_3$ precipitation (Zinn and Owens 1986); if >5% error occurred among triplicates, data were discarded and samples reanalyzed. Because information on dietary nitrogen intake obtained from the use of fecal diaminopilelic acid (DAPA) is similar to that obtained from fecal RNA concentration, and the latter assesses total micro-

bial yield versus partial bacterial yield, only fecal RNA concentrations were determined on collected feces.

Deer Collections

Adult female white-tailed deer were collected from each of the 3 study areas in February and August 1987-88. Deer were collected at night from clearcuts and associated natural vegetation by neck-shooting with a high power rifle. Two blood samples per deer were obtained via heart puncture using 2 types of Vacutainer tubes (Becton Dickinson, Rutherford, N.J.) that contained EDTA(K_3) (i.e., whole blood) and gel-clot activator (i.e., serum samples) immediately after animals were shot; samples then were placed on ice. Gastrointestinal tracts were removed from collected deer in the field, and carcasses were transported to a field station (1/study area) where deer were necropsied. During necropsies, heart and lungs were removed from deer, eviscerated carcasses were weighed (to the nearest lb and converted to kg), and number of fetuses/doe determined. Femurs also were removed from carcasses during necropsy for determination of femur marrow fat using the dry weight procedure (Neiland 1970).

Serum was obtained from whole blood postclotting by centrifuging samples for 15 minutes at 2000 rpm. Blood serum was then poured into resealable testubes, frozen at a nearby facility, and transported to the laboratory for analyses. Blood serum was analyzed for total protein, albumin, blood urea nitrogen, creatinine, glucose, calcium, and phosphorus using colorimetric procedures (Faulkner and Meites 1982). Serum globulin concentration was determined by subtracting albumin from total protein. Blood urea nitrogen:creatinine and albumin:globulin ratios were calculated from concentrations of applicable serum metabolites.

IV. RESULTS

Study Sites

Three study areas were selected that were similar in latitude, soil classifications, geography, and vegetational communities, but dissimilar in cattle stocking rates. Study areas were located in McCurtain County, Oklahoma (1 head/3 ha; heavy cattle stocking); Howard County, Arkansas (1 head/18 ha; moderate cattle stocking); and Pike County, Arkansas (no cattle stocking) (Fig. 1). Twelve disjunct habitat blocks (4/study area) were delineated for fecal collections. Blocks contained similar amounts of natural oak/pine habitat, loblolly pine plantations that were planted $\geq$5 years prior to the study, and loblolly pine plantations that were planted <5 years prior to the study or would be planted within the first year of our study (Table 1). Selection of study areas was approved by biologists of the Oklahoma Department of Wildlife Conservation and the Weyerhaeuser Company.

Food Habits

A minimum of 15 deer fecal groups was collected from most habitat blocks in McCurtain, Howard, and Pike counties during the 9 collections (i.e., Oct 1986 - Oct 1988). Only 6 deer groups were located in Blocks A and C of Pike County in October 1986, and 12 groups were located in Block C of Pike County in February 1987. Adequate fecal samples ($\geq$15) of cattle were collected during the 9 collections in McCurtain County. However, only 5 cattle samples were collected in October 1986, and no samples were collected in February 1987 and October 1988 in Howard County (reflecting the absence of cattle on the area).

Fecal samples were composited (168 total; 108 deer and 60 cattle), and subsamples mounted on microscope slides for diet analysis. A total of 250 plant species was collected and characterized (e.g., cell type, presence or absence of trichomes) for use in identification of fragments in composited fecal samples.

Dietary diversity of deer and cattle was high during all seasons studied (Figs. 2-6; Tables 2-16). Browse (e.g., *Lonicera* spp./*Symphoricarpos orbiculatus*, *Cornus* spp., *Quercus* spp.), including conifers (e.g., *Pinus* spp. and *Juniperus virginiana*), was the major constituent in deer diets in McCurtain and Howard counties in all seasons except May (Figs. 2, 3; Table 17). Furthermore, browse and conifers (e.g., *Lonicera* spp./*Symphoricarpos orbiculatus*, *Quercus* spp., *Rhus* spp., *Pinus* spp. and *Cornus* spp.) were the major constituents of deer diets in Pike County throughout the year and accounted for a minimum of 45.3% of diets (Fig. 4; Table 17). Conifers were highest in February diets in all 3 study areas and increased from 11.1% and 6.0% to 48.6% and 27.0% from February 1987 to 1988 in McCurtain and Howard counties, respectively (Figs. 2, 3; Table 17). Conifers tended to be higher in deer diets in all seasons in McCurtain County than in Pike County (Table 17).

Major forbs in deer diets included *Antennaria plantaginifolia*, *Abutilon threophrasti*, *Lespedeza* spp., *Solidago* spp., and *Croton capitatus*. The forb component of deer diets varied from a low of 2.5% in Pike County in February 1988 to a high of 47.6% in Howard County in May 1987. Forbs (e.g., composites) constituted 47.6% and 46.0% of deer diets in Howard County in May 1987 and McCurtian County in May 1988, respectively (Figs. 2, 3; Table 17). Pike County diets were consistently lowest in forbs in both winters. Mast (e.g., acorns, *Rhus* spp. seed heads, *Prunus* spp. drupes) varied from a high of 31.3% of diets of Pike County deer in August 1988 to a low of 1.2% of McCurtain County diets in May 1987. Ferns (e.g., *Polystichum acrosticoides*) accounted for 13.9% and 17.0% of deer diets in February 1987 in McCurtain County and February 1988 in Howard County, respectively (Table 17). Grasses (e.g., *Panicum* spp.) were highest in February and May diets and ranged from 16.9% to a low of 0.3% in Howard County in February 1988 and August 1987, respectively.

Diets of cattle in McCurtain and Howard counties were dominated by grasses (e.g., *Andropogon* spp. and *Panicum* spp.) (Tables 10-16). Percentages of grasses in cattle diets

ranged from a low of 59.2% in McCurtain County in October 1987 to a high of 95.5% in Howard County in August 1987 (Figs. 5, 6; Table 17). Cattle diets in Howard County were dominated by *Andropogon* spp., but the grass component of cattle diets in McCurtain County was more diverse. Browse (e.g., *Rhus* spp., *Cornus* spp.) and conifer (e.g., *Pinus* spp.) forage classes were lower throughout the study in Howard County than in McCurtain County. Peak use of browse and conifers by cattle occurred in February 1987 and 1988 (Fig. 5, 6) and corresponded to peak use of conifers by deer in McCurtain and Howard counties (Figs. 2, 3).

Although mast and fern forage classes accounted for a significant proportion of deer diets (Figs. 2-4), these categories were not abundant in cattle diets in either McCurtain or Howard counties (Figs. 5, 6). Forb use by cattle varied seasonally and ranged from a high of 25.7% in October 1987 in McCurtain County to a low of 2.9% in Howard County in February 1988. Forb (e.g., *Lespedeza* spp., *Croton capitatus*, *Solidago* spp.) use by cattle, as with browse and conifer, tended to be lower in Howard County (except during May 1987) than McCurtain County (Figs. 5, 6; Table 17).

Similarity indices calculated from dietary proportions of plant species ranged from 66.8% to 2.5% across all possible deer-deer and deer-cattle comparisons (Table 18). Generally, deer diets were more similar to deer diets from other study areas than to cattle diets. Across deer diets, dietary overlap of McCurtain and Pike counties tended to be lower than either McCurtain-Howard or Howard-Pike comparisons despite the high dietary overlap that occurred in October 1986. This lower dietary overlap indicated that deer diets from the heavily stocked area were most dissimilar from deer from the no cattle study area. Dietary overlap between sympatric deer and cattle populations was relatively low (<35%), but it tended to be higher in McCurtain County than in Howard County (Table 18).

Fecal Indices

Levels of fecal N were determined in composited deer feces collected from October

1986 to October 1988 (Fig. 7; Table 19). Analysis of fecal N levels of deer was conducted on data collected from February 1987 to October 1988 because only 8 seasons could be used in the ANOVA. A strong seasonal effect ($\underline{P} < 0.05$) was apparent in levels of fecal N with lowest levels occurring in February and peak levels occurring in May (Fig. 7; Table 19). Pike County fecal N was significantly lower than McCurtain and Howard counties in August and October but higher in February. No differences ($\underline{P} > 0.05$) in fecal N of deer from study areas occurred in May. As with deer, cattle fecal N varied seasonally ($\underline{P} < 0.05$) with lows occurring in February and levels peaking in May (Fig. 8; Table 19). Levels of fecal N were lower ($\underline{P} < 0.05$) in cattle from Howard County in February, August, and October than cattle from McCurtain County.

Fecal RNA of deer varied seasonally ($\underline{P} < 0.05$) over the 2 years of the study (Fig. 9; Table 20). Levels were higher ($\underline{P} < 0.05$) in May 1988 than August 1987-88 and October 1987-88 (Fig. 9; Table 20). Statistical interactions occurred by season, year, and area (Fig. 9). Despite the inherent variability of this index, Pike County deer were lower ($\underline{P} < 0.05$) in fecal RNA in August 1987-88 and in October 1987 than McCurtain and Howard counties, which was consistent with fecal N levels. As with deer, fecal RNA levels of cattle also were variable and showed no consistent trends either seasonally or yearly (Fig. 10, Table 20).

Deer Collections

A total of 92 (62 female; 30 male) white-tailed deer was collected from February 1987 to August 1988 (Table 21). An adequate sample of females allowed comparisons of body and blood serum attributes for the 3 study areas. However, the male sample was limited in February 1987 and 1988 when no males were collected in Howard County. Males were collected on all study areas in August, but only 3 males were collected from McCurtain County (2 in 1987; 1 in 1988).

Carcass weights for female deer collected in McCurtain and Howard counties in February were lower ($\underline{P} = 0.005$) than deer collected in Pike County (Table 22). However,

deer collected in Pike County in August did not differ ($\underline{P}$ = 0.11) in carcass weight from deer collected in the other 2 counties; deer collected in Howard County in August had heavier ($\underline{P}$ = 0.04) carcass weights than deer from McCurtain County. Deer collected from Pike County had the highest percentage of femur fat ($\underline{P}$ = 0.001) in February and August and reproductive rate ($\underline{P}$ = 0.01) in February (Table 22). Deer collected from Howard and McCurtain counties were similar in percent femur fat ($\underline{P}$ = 0.18) and reproductive rate ($\underline{P}$ = 0.64).

Blood serum albumin of deer was lower ($\underline{P}$ = 0.02) for McCurtain County during February and August than Howard County deer; serum albumin for Pike County deer was intermediate but not different ($\underline{P}$ = 0.56) from the other 2 study areas (Table 23). Serum globulin levels were similar ($\underline{P}$ = 0.23) for deer collected from the 3 study areas. Albumin/globulin ratios were lower ($\underline{P}$ = 0.001) for McCurtain County deer than for Howard County deer in February and August; ratios for deer in Pike County were intermediate and did not differ ($\underline{P}$ = 0.95) from the other 2 study areas. Serum glucose was similar ($\underline{P}$ = 0.25) for deer in all 3 study areas in February but was lower ($\underline{P}$ = 0.01) in McCurtain County than in Howard County in summer. As with serum albumin and the albumin/globulin ratio, deer in Pike County were intermediate in serum glucose in summer and did not differ ($\underline{P}$ = 0.38) from the other 2 study areas. Blood urea nitrogen also was not different ($\underline{P}$ = 0.26) for deer collected from the 3 study areas in February but was lower ($\underline{P}$ = 0.001) in Pike County deer than in deer from McCurtain and Howard counties in August (Table 23). Deer from McCurtain and Howard counties were similar ($\underline{P}$ = 0.10) in serum blood urea nitrogen in August. Serum creatinine was not different ($\underline{P}$ = 0.92) across deer collected from study areas, but BUN/creatinine ratios were lower ($\underline{P}$ = 0.02) in Pike County deer than in deer from both McCurtain and Howard counties, which had similar levels ($\underline{P}$ = 0.92) of this blood constituent. Serum calcium ($\underline{P}$ = 0.21) did not differ in deer collected from the 3 study areas. However, serum phosphorus was lower ($\underline{P}$ = 0.05) for deer collected in Pike County than in the other 2 study areas, which were similar ($\underline{P}$ = 0.08). Con-

versely, the calcium/phosphorus ratio was higher ($\underline{P}$ = 0.04) in Pike County deer than in deer from McCurtain and Howard counties, which did not differ ($\underline{P}$ = 0.68) from one another.

Indices of nutritional condition that were statistically different among the 3 study areas were ranked; an area received a 3 if significantly higher, 2 if intermediate and not different from other areas, and 1 if significantly lower in an index (Table 24). Although the use of ranks was limited to assays that differed significantly among the 3 deer populations, the sum of the ranks by season indicated that deer in Pike County were in the best nutritional condition in February; McCurtain County deer were in the poorest condition. In August, the total sum of ranks indicated that deer in Howard County were in the best nutritional condition; McCurtain County deer, as in February, ranked lowest.

V. DISCUSSION

Diets of deer exposed to a continuum of cattle stocking pressure were variable, but they did differ consistently in conifer forage class across the 3 study areas. In February, conifer consumption tended to increase with cattle stocking rate (especially in February 1988). Conifers are low in digestibility (e.g., *Pinus* spp. digestibility in winter = 44.1% [Blair et al. 1977]) in all seasons, and the high level of conifer consumption in McCurtain County in winter suggests that forage availability may have been limited. Conversely, diets of deer from Pike County were lowest in conifer but highest in *Lonicera* spp./*Symphoricarpos orbiculatus*, which averaged 35.2% of the diet in February 1987-88. Blair et al. (1980) found that *Lonicera japonica* had a digestibility of 64.7% in January. Furthermore, Segelquist et al. (1971) found *L. japonica* leaves to be more digestible in winter than any native forage in Arkansas. Thus, the lower percentage of *Lonicera* spp./*Symphoricarpos orbiculatus* and higher conifer in diets of deer exposed to cattle stocking in winter could negatively affect the nutritional condition of deer during this season. Diets of deer in other seasons showed no consistent trends that could be attributed to the effect of cattle stocking.

Dietary overlap was relatively low (<67%) among deer from the 3 study areas and deer-cattle comparisons (<35%) (Table 18). Low dietary overlap among deer populations might have resulted from a shift in plant species composition due to the presence of cattle on McCurtain and Howard study areas, which is consistent with the higher dietary overlap between McCurtain-Howard and Howard-Pike deer populations. Although dietary overlap between deer and cattle was low, it was considerably higher than overlap between cattle and mule deer in the Piceance Basin, Colorado (≤4% [Hubbard and Hansen 1976]). Seasonal percent dietary overlaps (means for our study; spring = 21.1, summer = 17.2, autumn = 17.9, winter = 32.9) were lower than those determined for deer and cattle in central Louisiana in spring and autumn (spring = 25.8, autumn = 26.0), higher in summer (11.8), and similar for winter (30.7) (Thill and Martin 1989). Dietary overlap between deer and cattle was highest in February in McCurtain County and approached the highest level in Howard County, which further suggested that the season of highest competition between deer and cattle is winter. McMahan (1964) considered competition to be heavy between deer and cattle, goats, and sheep during winter on the Edwards Plateau of Texas.

Deer fecal N has been used as an index to dietary quality (Leslie and Starkey 1985) and to rank quality of wintering areas in Maine (Hodgman and Bowyer 1986). Deer fecal N varied seasonally and differed significantly among the 3 populations that we studied. Deer feces from Pike County were significantly higher in fecal N than feces from McCurtain and Howard counties in February, which support the contention that competition between cattle and deer may have occurred in this season. Conversely, feces from Pike County were significantly lower in fecal N in August and October, which may suggest some positive effect from cattle during these seasons. Cattle fecal N was lower in feces collected from Howard County in August, October, and February than in feces from McCurtain County. The higher levels of fecal N in cattle feces from McCurtain County may have resulted from the higher intake of browse, which is generally higher in nitrogen content than grasses (Blair et

al. 1977) and might be expected because of the higher dietary overlap of deer and cattle in McCurtain County.

Condition characteristics (e.g., body weight) of deer have been used to compare populations under differing densities (Kie et al. 1983) and nutritional constraints (Seal et al. 1978). Kie et al. (1983) suggested that body weights and fat attributes (femur and kidney) were best for characterizing physical condition from collected specimens of deer. In our study, carcass weights, percent femur fat, and fetuses/doe were consistently lower in February for deer populations exposed to heavy cattle stocking in McCurtain County. Furthermore, deer collected from McCurtain and Howard counties in February ranked lower in total condition ranking than deer collected from Pike County (Table 24); that comparison incorporated both carcass characteristics and metabolic indicators of nutritional condition.

Our data on nutritional condition of collected deer paralleled dietary and fecal N information, and in total, they suggested that deer were affected negatively by cattle stocking in February. Although deer collected from McCurtain County in August were the lowest in total condition ranking (Table 24), deer collected from Howard County ranked highest, which suggested that there might have been a positive effect of moderate stocking during summer. Nevertheless, most indicators suggested that deer populations in areas of heavy cattle stocking (i.e., McCurtain County) were negatively affected with overall nutritional condition below what we observed in deer in areas without any stocking (i.e., Pike County).

VI. MANAGEMENT SUGGESTIONS

It has been difficult for biologists to document competition among free-ranging populations of ungulates (Anthony and Smith 1977, Leslie et al. 1984, Jenkins and Wright 1988). Most studies have inferred competitive interactions and their subsequent effects by evaluating some combination of indices of forage availability, diet, physical and nutritional condition, reproductive output, habitat use, etc. In our study, we selected diet, various

aspects of physical and nutritional condition, and reproductive output as the means of assessing the effect of cattle stocking on white-tailed deer in managed pine plantations. Importantly, our 3 study areas were selected to focus on the specific effects of cattle on white-tailed deer and to minimize effects of other obvious biological factors (e.g., variation in habitat type availability). If our selection of study areas achieved that goal (and we believe that it did), differences in deer biology among the 3 study areas can be attributed fairly to the effects of cattle.

Our results suggest that competition between deer and cattle for forage and nutrients occurs during winter. If higher consumption of conifers, lower FN, lower carcass weights, and lower reproductive rates of deer collected in McCurtain County resulted from the effects of heavy cattle stocking (as our study design suggests), we would hypothesize that a reduction in winter cattle stocking in McCurtain County would positively affect deer nutritional condition and reproduction. Because negative effects of cattle stocking were not consistently found in other seasons, a reduction in cattle stocking during spring, summer, or autumn may not result in improved deer nutritional condition.

Negative effects of heavy cattle stocking in McCurtain County may be reduced or mediated by the removal and/or significant reduction of cattle from Weyerhaeuser property in winter. Because physical and reproductive characteristics of female deer collected during our study from McCurtian and Howard counties in winter did not differ statistically, we surmise that a reduction in cattle stocking to <1 head/18 ha (i.e., that in Howard County during our study) would be necessary before a positive effect on deer nutritional condition would likely occur. Unfortunately, the specific cattle stocking level that would result in a positive effect on deer nutritional condition in McCurtain County cannot be determined from our study alone. Therefore, we recommend that a follow-up study be conducted during which cattle are removed from our study area in McCurtain County in winter, and deer condition and reproductive output are monitored over a 4-year period. We hypothesize that reproductive output would be enhanced.

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IX. APPROVED BY Dr. Harold Namminga, Federal Aid/Research Coordinator

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Table 1. Vegetation composition of study area blocks delineated for collection of plant and fecal material.

County		Percent Natural Vegetation	Percent 0-4 yr. Plantations	Percent >=5 yr. Plantations	Hectares
McCurtain					
	Block A	34	28	38	1536
	Block B	41	24	35	946
	Block C	33	33	34	1541
	Block D	26	36	37	1144
Howard					
	Block A	28	39	32	1240
	Block B	31	39	30	1244
	Block C	40	27	33	1329
	Block D	29	37	34	1569
Pike					
	Block A	38	33	29	1236
	Block B	29	27	44	1205
	Block C	17	35	48	1273
	Block D	29	31	40	634

Table 2. Estimates of percent species composition of October 1986 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Acalypha gracilens	2.03 (0.88)[a]	4.31 (0.31)	3.41 (1.78)
Acer rubrum	0.00	0.14 (0.14)	0.01 (0.01)
Agropyron spicatum	0.37 (0.37)	0.16 (0.16)	0.04 (0.04)
Ambrosia spp.	0.13 (0.13)	0.08 (0.08)	0.66 (0.46)
Andropogon virginicus	0.00	0.00	0.31 (0.31)
Antennaria plantaginifolia	9.05 (3.17)	1.70 (0.70)	0.71 (0.28)
Aristida spp.	0.05 (0.05)	0.00	0.00
Aster spp.	0.02 (0.02)	0.65 (0.34)	0.07 (0.07)
Bouteloua spp.	0.00	0.82 (0.29)	0.13 (0.13)
Callicarpa americana	0.39 (0.26)	2.56 (1.25)	0.65 (0.65)
Callirhoe digitata	0.00	0.22 (0.22)	0.16 (0.13)
Carex spp.	0.02 (0.02)	0.36 (0.36)	0.00
Ceanothus americanus	3.64 (2.40)	0.56 (0.33)	1.81 (0.58)
Celtis spp.	0.19 (0.19)	0.00	0.17 (0.17)
Clitoria mariana	1.40 (0.55)	0.32 (0.26)	0.01 (0.01)
Cornus spp.	3.81 (0.85)	6.41 (1.74)	3.67 (1.65)

Table 2. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Croton capitatus	0.30 (0.23)	0.45 (0.13)	0.25 (0.25)
Cunila organoides	0.00	0.14 (0.14)	0.00
Cynoglossum amabile	0.26 (0.26)	0.72 (0.42)	0.16 (0.11)
Danthonia spicatum	0.00	0.00	0.04 (0.04)
Desmodium rotundifolium	1.47 (0.81)	2.88 (2.07)	0.90 (0.75)
Elymus canadensis	0.05 (0.05)	0.00	0.04 (0.04)
Eragrostis spp.	0.00	0.10 (0.10)	0.00
Erigeron spp.	0.93 (0.47)	0.27 (0.16)	0.96 (0.50)
Fraxinus spp.	7.20 (1.28)	0.96 (0.64)	4.65 (1.96)
Gleditsia triacanthos	0.00	0.49 (0.49)	0.12 (0.12)
Helianthus spp.	0.20 (0.12)	1.17 (0.69)	0.17 (0.17)
Hypericum spp.	0.13 (0.13)	0.41 (0.24)	0.86 (0.64)
Juncus spp.	0.00	0.12 (0.12)	0.00
Juniperous virginiana	0.15 (0.15)	0.00	0.00
Lepidium oblongum	0.43 (0.43)	0.33 (0.33)	0.00
Lespedeza spp.	1.03 (0.64)	1.96 (1.24)	0.85 (0.75)
Lonicera spp./ Symphoricarpos orbiculatus	2.12 (1.01)	9.21 (1.13)	13.05 (7.19)

Table 2. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
Monarda spp.		0.00	0.05 (0.05)	0.00
Myrica spp.		0.00	0.00	0.24 (0.15)
Nyssa sylvatica		0.00	0.00	0.20 (0.20)
Oxalis spp.		0.08 (0.08)	0.00	0.00
Panicum spp.		0.55 (0.25)	1.37 (0.97)	1.73 (1.03)
Parthenocissus quinquefolia		0.03 (0.03)	0.00	0.04 (0.04)
Phlox spp.		0.21 (0.21)	0.00	3.37 (2.40)
Phytolacca americana		0.00	0.17 (0.17)	0.00
Pinus spp.		8.94 (1.49)	2.95 (0.95)	3.72 (1.31)
Plantago spp.		0.18 (0.18)	1.42 (0.47)	0.40 (0.39)
Platanus occidentalis		0.15 (0.15)	0.58 (0.24)	0.35 (0.35)
Polystichum acrostichoides		0.00	0.24 (0.24)	0.81 (0.41)
Potentilla spp.		0.03 (0.03)	0.22 (0.22)	0.00
Prunus spp.		0.41 (0.41)	1.37 (0.66)	0.48 (0.33)
Pycnanthemum tenuifolium		0.04 (0.04)	0.00	0.01 (0.01)
Quercus spp.	fruit	16.19 (5.20)	19.11 (2.47)	14.44 (2.12)
	leaf	2.32 (0.42)	2.94 (0.93)	2.00 (1.00)
Rhus spp.	fruit	0.86 (0.54)	0.34 (0.20)	4.08 (1.57)
	twigs	16.71 (3.36)	6.44 (3.20)	10.77 (0.86)

Table 2. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Rosa spp.	0.00	0.00	0.05 (0.05)
Rubus spp.	0.00	0.17 (0.17)	0.28 (0.28)
Rudbeckia hirta	0.00	0.00	0.51 (0.51)
Smilax spp.	1.43 (0.98)	2.20 (1.28)	3.35 (1.90)
Solidago spp.	0.21 (0.14)	0.53 (0.45)	4.47 (3.16)
Strophostyles spp.	0.34 (0.29)	0.00	0.11 (0.11)
Toxicodendron radicans	0.00	0.28 (0.28)	0.02 (0.02)
Tradscandia spp.	0.00	0.00	0.05 (0.05)
Trifolium reflexum	0.05 (0.05)	0.00	0.09 (0.06)
Ulmus spp.	0.24 (0.24)	0.83 (0.83)	0.07 (0.07)
Vaccinium spp.	0.05 (0.05)	0.06 (0.06)	0.00
Vitus spp.	0.11 (0.11)	0.00	2.28 (1.72)
Unknown browse	3.45 (1.67)	2.47 (0.83)	0.64 (0.26)
Unknown composite	1.06 (0.42)	2.44 (0.46)	0.78 (0.40)
Unknown fern	0.00	0.62 (0.62)	0.00
Unknown forb	0.70 (0.20)	0.53 (0.43)	1.44 (0.95)
Unknown fruit	2.92 (2.85)	6.78 (4.70)	2.72 (2.52)
Unknown legume	4.76 (0.82)	5.54 (2.28)	3.77 (1.38)
Unknown grass	2.34 (0.90)	2.13 (0.82)	1.53 (0.46)
Unknown	0.27	0.72	1.25

[a]Standard error in parentheses.

Table 3. Estimates of percent species composition of February 1987 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Acalypha gracilens	0.27 (0.16)[a]	0.09 (0.09)	0.43 (0.15)
Acer rubrum	0.00	0.06 (0.06)	0.19 (0.13)
Alnus spp.	0.06 (0.06)	0.00	0.00
Ambrosia spp.	0.75 (0.37)	0.14 (0.06)	0.00
Andropogon virginicus	1.26 (0.62)	1.10 (0.51)	1.38 (0.57)
Antennaria plantaginifolia	9.87 (6.98)	6.50 (3.77)	1.95 (0.94)
Arundinaria gigantea	0.76 (0.76)	0.00	0.00
Aster spp.	0.40 (0.26)	0.00	0.00
Bouteloua spp.	0.08 (0.08)	0.03 (0.03)	0.00
Callicarpa americana	0.02 (0.02)	0.03 (0.03)	0.00
Callirhoe digitata	0.13 (0.09)	0.54 (0.20)	0.00
Carex spp.	2.12 (1.66)	0.27 (0.16)	0.60 (0.60)
Celtis spp.	0.36 (0.30)	0.27 (0.27)	0.39 (0.25)
Coreopsis spp.	0.00	0.00	0.01 (0.01)
Cornus spp.	14.41 (6.95)	2.92 (1.37)	3.17 (1.40)
Croton capitatus	0.00	0.17 (0.17)	0.15 (0.09)
Cynoglossum amabile	0.00	0.00	0.03 (0.03)

Table 3. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Danthonia spicatum	1.62 (1.39)	0.22 (0.22)	0.63 (0.54)
Desmodium rotundifolium	0.13 (0.13)	0.00	0.13 (0.08)
Elymus canadensis	0.15 (0.12)	0.50 (0.50)	0.03 (0.03)
Eragrostis spp.	0.45 (0.35)	0.14 (0.14)	0.00
Erigeron spp.	1.63 (1.12)	1.20 (0.42)	0.11 (0.06)
Eupatorium spp.	0.33 (0.33)	0.00	0.00
Festuca spp.	0.00	0.08 (0.08)	0.20 (0.20)
Fraxinus spp.	7.01 (1.39)	14.50 (2.17)	1.21 (0.65)
Helianthus spp.	0.58 (0.28)	0.66 (0.39)	0.35 (0.18)
Hypericum spp.	0.63 (0.32)	0.97 (0.56)	0.00
Ilex spp.	0.78 (0.44)	3.50 (1.16)	1.54 (0.69)
Juniperus virginiana	0.61 (0.48)	0.87 (0.73)	0.19 (0.19)
Lepidium oblongum	0.00	0.00	1.80 (1.43)
Lespedeza spp.	0.04 (0.04)	0.86 (0.86)	0.00
Lonicera spp./ Symphoricarpos orbiculatus	1.21 (0.19)	11.26 (2.35)	39.86 (6.05)
Monarda spp.	0.08 (0.08)	0.00	0.00
Oenothera lauvandulaefolia	0.03 (0.03)	0.00	0.00
Oxalis spp.	0.16 (0.11)	0.00	0.09 (0.06)

Table 3. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Panicum spp.	5.07 (2.12)	2.97 (0.86)	3.80 (1.37)
Parthenocissus quinquefolia	0.04 (0.04)	0.06 (0.06)	0.00
Phlox spp.	0.10 (0.10)	0.12 (0.12)	0.31 (0.31)
Pinus spp.	10.52 (2.92)	5.13 (2.47)	5.32 (1.21)
Plantago spp.	0.31 (0.26)	1.17 (0.69)	0.00
Platanus Occidentalis	0.33 (0.18)	0.00	0.48 (0.48)
Polystichum acrostichoides	13.87 (7.14)	1.47 (0.98)	2.06 (1.13)
Potentilla spp.	0.05 (0.05)	0.14 (0.08)	0.05 (0.05)
Prunus spp.	0.00	0.16 (0.11)	0.05 (0.05)
Quercus spp. fruit	0.40 (0.24)	0.34 (0.19)	13.83 (7.87)
leaf	1.48 (1.17)	5.31 (3.28)	1.54 (0.65)
Rhus spp. fruit	4.62 (3.32)	11.40 (3.78)	2.51 (1.58)
twigs	6.16 (1.82)	12.37 (2.27)	2.35 (0.76)
Rubus spp.	0.64 (0.64)	0.25 (0.15)	0.05 (0.05)
Smilax spp.	0.97 (0.41)	3.24 (2.53)	4.36 (0.94)
Solidago spp.	0.05 (0.05)	0.07 (0.07)	0.20 (0.20)
Toxicodendron radicans	0.06 (0.06)	0.00	0.00
Trifolium reflexum	0.31 (0.18)	0.49 (0.40)	0.11 (0.11)
Ulmus spp.	0.02 (0.02)	0.19 (0.14)	0.11 (0.11)

Table 3. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Vaccinium spp.	0.32 (0.23)	0.05 (0.05)	0.28 (0.28)
Vernonia spp.	0.00	0.00	0.15 (0.15)
Unknown composite	0.95 (0.69)	1.36 (0.47)	0.61 (0.32)
Unknown browse	1.14 (0.76)	0.89 (0.24)	0.48 (0.48)
Unknown forb	1.37 (0.75)	0.30 (0.09)	0.58 (0.26)
Unknown fruit	0.11 (0.06)	1.80 (0.84)	0.58 (0.37)
Unknown legume	0.26 (0.12)	0.26 (0.16)	0.13 (0.05)
Unknown grass	4.79 (1.35)	3.88 (0.63)	4.87 (2.00)
Unknown	0.13	0.00	0.75

[a]Standard error in parentheses.

Table 4. Estimates of percent species composition of May 1987 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Abutilon threophrasti	1.15 (1.20)[a]	3.30 (1.06)	4.92 (0.99)
Acalypha gracilens	1.80 (1.09)	1.84 (0.79)	1.91 (1.65)
Agropyron spicatum	0.37 (0.37)	0.32 (0.32)	0.00
Ambrosia spp.	0.05 (0.05)	0.00	0.28 (0.11)
Andropogon spp.	0.20 (0.20)	0.00	2.07 (1.01)
Antennaria plagantifolia	4.57 (2.78)	0.87 (0.30)	0.53 (0.11)
Aster spp.	0.68 (0.34)	0.36 (0.28)	0.36 (0.36)
Baccharis spp.	0.00	0.00	0.16 (0.16)
Berchemia scandens	0.39 (0.39)	0.00	0.19 (0.19)
Bouteloua spp.	0.00	0.56 (0.40)	0.00
Callicarpa americana	1.23 (0.82)	0.83 (0.28)	1.32 (0.96)
Callirhoe digitata	9.00 (3.01)	12.53 (4.51)	7.42 (1.61)
Carpinus caroliniana	0.19 (0.19)	0.00	0.00
Carex spp.	0.14 (0.14)	0.00	0.29 (0.29)
Cassia spp.	0.59 (0.59)	0.55 (0.55)	0.23 (0.23)
Ceanothus americanus	1.60 (1.10)	0.59 (0.34)	0.00

Table 4. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Chionanthus virginicus	0.04 (0.04)	0.03 (0.03)	0.00
Clitoria mariana	0.61 (0.52)	0.00	0.08 (0.08)
Cornus spp.	8.67 (2.87)	4.88 (2.75)	7.75 (1.31)
Croton capitatus	0.20 (0.20)	0.67 (0.42)	0.55 (0.37)
Cynoglossum amabile	0.54 (0.54)	0.80 (0.68)	0.00
Desmodium spp.	0.11 (0.11)	2.56 (1.27)	0.90 (0.90)
Eragrostis spp.	0.05 (0.05)	0.00	0.00
Erigeron spp.	0.09 (0.09)	0.15 (0.15)	0.32 (0.15)
Erianthus contortus	0.00	0.31 (0.31)	0.00
Eupatorium spp.	0.00	0.00	0.24 (0.24)
Fraxinus spp.	1.00 (0.58)	1.56 (0.89)	2.56 (0.84)
Geranium spp.	0.10 (0.10)	0.00	0.00
Gleditsia triacanthos	0.00	0.34 (0.34)	0.00
Hammamelis vernalis	0.93 (0.78)	0.06 (0.06)	0.10 (0.10)
Helianthus spp.	3.28 (0.90)	2.51 (1.50)	2.20 (0.62)
Hypericum spp.	2.12 (1.36)	1.78 (0.88)	0.31 (0.31)
Ilex spp.	0.26 (0.26)	0.94 (0.94)	0.00
Juncus spp.	0.78 (0.78)	2.33 (2.33)	1.77 (0.78)
Juniperus virginiana	3.26 (3.26)	0.11 (0.11)	0.00

Table 4. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Lepidium oblongatum	0.00	0.00	0.12 (0.12)
Lespedeza spp.	0.22 (0.22)	1.77 (1.00)	2.20 (1.63)
Lonicera spp./ Symphoricarpos orbiculatus	4.14 (1.75)	5.71 (2.50)	10.15 (3.72)
Magnolia spp.	0.39 (0.39)	0.00	0.00
Monarda spp.	0.00	1.12 (0.55)	1.03 (0.92)
Myrica spp.	1.38 (1.22)	4.28 (3.88)	1.06 (1.06)
Nyssa sylvatica	0.34 (0.34)	0.06 (0.06)	0.00
Oenothera lauvandulaefolia	0.01 (0.01)	0.00	0.03 (0.03)
Ostrya virginiana	0.13 (0.13)	0.00	2.55 (2.55)
Oxalis spp.	0.46 (0.19)	0.31 (0.24)	1.01 (0.76)
Panicum spp.	0.00	0.29 (0.29)	0.44 (0.44)
Parthenocissus quinquefolia	0.00	0.30 (0.30)	0.00
Penstemmon spp.	0.09 (0.09)	0.00	1.80 (1.54)
Phlox spp.	0.00	0.28 (0.19)	0.00
Pinus spp.	5.44 (2.54)	1.89 (1.10)	3.08 (1.53)
Plantago spp.	2.13 (0.75)	3.55 (2.37)	1.07 (0.24)
Platanus occidentalis	0.00	0.00	0.55 (0.55)
Polystichum acrostichoides	1.08 (1.01)	0.32 (0.32)	0.00

Table 4. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
Potentilla spp.		0.00	2.43 (2.43)	0.00
Prunus spp.		0.75 (0.59)	3.96 (1.53)	0.48 (0.29)
Pycnanthemum spp.		0.00	0.63 (0.63)	0.00
Quercus spp.	fruit	0.98 (0.31)	2.46 (0.23)	4.98 (1.22)
	leaves	0.73 (0.73)	1.55 (0.57)	2.20 (2.20)
Rhamnus spp.		0.73 (0.73)	0.00	0.00
Rhus spp.	fruit	0.26 (0.26)	1.79 (1.79)	0.56 (0.24)
	leaves	3.21 (1.93)	1.08 (0.82)	3.81 (1.48)
Rubus spp.		3.19 (2.48)	1.10 (0.64)	3.02 (0.71)
Scutellaria ovata		0.00	0.11 (0.11)	0.00
Sida rhombifolia		0.00	0.00	0.14 (0.14)
Smilax spp.		0.00	1.65 (0.62)	1.05 (0.68)
Solidago spp.		0.47 (0.47)	0.80 (0.25)	2.05 (0.65)
Strophostiles spp.		0.00	0.32 (0.19)	0.33 (0.33)
Toxicodendron radicans		5.44 (2.17)	3.71 (1.15)	3.33 (1.32)
Tradscandia spp.		0.00	0.00	0.23 (0.23)
Trifolium reflexum		1.35 (0.68)	3.11 (2.16)	1.94 (1.10)
Ulmus spp.		0.00	0.47 (0.18)	0.13 (0.13)
Vaccinium spp.		0.18 (0.18)	0.14 (0.14)	0.00
Vitus spp.		0.19 (0.19)	2.18 (1.32)	0.00

Table 4. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Unknown browse	1.37 (0.76)	0.54 (0.44)	0.00
Unknown composite	1.60 (0.82)	0.78 (0.46)	0.63 (0.63)
Unknown fern	4.00 (3.36)	0.67 (0.36)	1.13 (0.95)
Unknown forb	4.41 (0.80)	4.74 (0.92)	6.91 (1.48)
Unknown legume	1.19 (0.30)	1.59 (0.63)	0.89 (0.55)
Unknown grass	1.88 (0.42)	0.81 (0.39)	2.28 (0.87)
Unknown	8.26	2.72	2.46

[a]Standard error in parentheses.

Table 5. Estimates of percent species composition of August 1987 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Abutilon threophrasti	0.50 (0.50)[a]	0.15 (0.10)	0.00
Acer rubrum	1.49 (1.06)	0.00	0.00
Alnus spp.	1.23 (1.23)	0.00	0.06 (0.06)
Ambrosia spp.	0.06 (0.06)	0.46 (0.23)	0.11 (0.11)
Antennaria plantaginifolia	0.46 (0.33)	0.19 (0.04)	0.22 (0.13)
Aristida spp.	0.00	0.00	0.16 (0.16)
Aster spp.	0.29 (0.22)	0.00	0.00
Bouteloua spp.	0.00	0.00	0.81 (0.60)
Callirhoe digitata	9.04 (2.63)	9.91 (3.06)	3.39 (1.47)
Cassia upp.	0.39 (0.39)	0.00	0.00
Chionanthus virginicus	0.00	0.05 (0.05)	0.00
Clitoria mariana	1.42 (0.33)	1.09 (0.58)	0.26 (0.22)
Cornus spp.	2.17 (1.19)	2.04 (0.47)	1.64 (0.87)
Croton capitatus	1.58 (0.63)	1.39 (0.90)	0.54 (0.54)
Desmodium spp.	0.06 (0.06)	0.00	0.00
Erigeron spp.	3.65 (2.55)	0.31 (0.31)	0.00
Eupatorium spp.	0.00	0.00	0.03 (0.03)
Euphorbia spp.	0.94 (0.43)	0.51 (0.35)	0.46 (0.41)
Fraxinus spp.	3.28 (1.08)	0.77 (0.30)	1.61 (0.82)

Table 5. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Geranium spp.	0.04 (0.04)	0.00	0.00
Hypericum spp.	0.15 (0.15)	0.49 (0.49)	0.17 (0.17)
Ilex spp.	1.29 (0.90)	0.20 (0.20)	0.94 (0.79)
Juncus spp.	0.00	0.07 (0.07)	0.07 (0.07)
Lespedeza spp.	2.21 (0.76)	1.73 (0.67)	0.70 (0.20)
Lonicera spp./ Symphoricarpos orbiculatus	1.71 (0.74)	8.09 (2.41)	9.65 (3.22)
Monarda spp.	0.42 (0.15)	1.49 (0.77)	0.35 (0.22)
Morus rubra	0.00	0.18 (0.18)	0.00
Ostrya virginiana	0.00	0.23 (0.15)	0.05 (0.05)
Oxalis spp.	0.00	0.57 (0.07)	0.11 (0.06)
Panicum spp.	0.11 (0.11)	0.00	3.23 (3.23)
Parthenocissus quinquefolia	0.50 (0.34)	0.38 (0.38)	0.00
Phlox spp.	0.00	0.00	0.48 (0.35)
Phytolacca americana fruit	0.06 (0.06)	0.06 (0.06)	0.32 (0.32)
Pinus spp.	2.55 (1.59)	0.87 (0.63)	1.61 (0.58)
Plantago spp.	0.16 (0.16)	0.30 (0.28)	0.06 (0.06)
Platanus occidentalis	0.00	0.00 (0.11)	0.06 (0.06)
Prunus spp. fruit	0.00	0.20 (0.20)	0.11 (0.11)

Table 5. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
	leaves	2.27 (0.70)	8.50 (6.53)	0.69 (0.30)
Psoralea spp.		0.30 (0.20)	0.00	0.00
Quercus spp.	fruit	1.03 (0.64)	2.34 (0.88)	0.49 (0.19)
	leaves	0.25 (0.25)	0.53 (0.53)	1.42 (0.68)
Rhus spp.	fruit	9.41 (1.01)	1.48 (1.33)	1.04 (0.97)
	leaves	13.85 (3.34)	13.65 (3.65)	5.45 (2.77)
Rosa spp.		0.00	0.73 (0.54)	0.00
Rubus spp.		6.47 (3.06)	9.92 (3.82)	22.18 (4.60)
Rudbeckia hirta		0.00	0.16 (0.16)	0.00
Smilax spp.		1.07 (0.49)	2.74 (0.78)	3.49 (1.33)
Solidago spp.		0.38 (0.21)	1.22 (0.70)	1.15 (0.44)
Strophostiles spp.		0.87 (0.32)	0.35 (0.24)	0.11 (0.11)
Toxicodendron radicans		1.88 (0.12)	0.74 (0.16)	0.16 (0.16)
Trifolium reflexum		1.14 (0.59)	1.91 (1.18)	0.48 (0.28)
Ulmus spp.		0.00	0.10 (0.10)	0.00
Vaccinium spp.		0.12 (0.12)	0.60 (0.35)	0.55 (0.35)
Vitus spp.		0.97 (0.51)	1.69 (1.05)	0.38 (0.22)
Unknown browse		2.39 (1.10)	2.18 (0.50)	13.74 (3.63)
Unknown composite		0.42 (0.28)	0.90 (0.36)	0.05 (0.05)
Unknown fern		0.12 (0.12)	0.17 (0.17)	0.07 (0.07)

Table 5. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Unknown forb	2.14 (0.83)	2.42 (1.18)	1.29 (0.40)
Unknown fruit	3.63 (0.58)	5.47 (1.18)	12.87 (5.01)
Unknown legume	11.01 (2.33)	7.24 (3.47)	1.80 (0.69)
Unknown grass	1.45 (0.43)	0.22 (0.13)	1.29 (0.71)
Unknown	3.07	3.01	4.10

[a]Standard error in parentheses.

Table 6. Estimates of percent species composition of October 1987 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Acer rubrum	2.08 (0.09)[a]	4.52 (2.47)	0.06 (0.06)
Alnus spp.	0.00	0.09 (0.09)	0.05 (0.05)
Andropogon spp.	0.00	0.00	1.04 (1.04)
Aster spp.	0.62 (0.38)	0.28 (0.21)	0.17 (0.17)
Bouteloua spp.	0.00	0.60 (0.60)	0.00
Callicarpa americana	0.00	0.00	0.19 (0.19)
Callirhoe digitata	0.14 (0.14)	1.13 (0.81)	0.88 (0.44)
Carex spp.	0.02 (0.02)	0.00	0.00
Chionanthus virginicus	0.00	0.03 (0.03)	0.00
Clitoria mariana	0.00	0.12 (0.12)	0.19 (0.19)
Cornus spp.	2.33 (1.85)	2.52 (0.85)	1.25 (0.42)
Croton capitatus	1.23 (0.29)	1.09 (0.43)	1.11 (0.67)
Danthonia spicatum	0.00	0.00	0.29 (0.29)
Desmodium spp.	0.26 (0.26)	0.69 (0.27)	0.00
Elymus canadensis	0.00	0.07 (0.07)	0.00
Eragrostis spp.	1.17 (0.58)	0.23 (0.18)	0.00
Eupatorium spp.	0.11 (0.11)	1.53 (1.07)	0.00
Fraxinus spp.	12.98 (1.31)	1.09 (0.38)	0.86 (0.74)
Gelsemia spp.	0.00	0.18 (0.18)	0.00

Table 6. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
Geranium spp.		0.00	0.01 (0.01)	0.00
Hypericum spp.		0.00	0.24 (0.24)	0.86 (0.86)
Ilex spp.		1.40 (0.85)	2.79 (2.04)	2.63 (2.02)
Juncus spp.		0.72 (0.57)	3.37 (2.75)	1.06 (1.06)
Lepidium oblongatum		2.37 (1.61)	2.50 (0.68)	1.05 (0.32)
Lonicera spp./ Symphoricarpos orbiculatus		1.19 (0.33)	6.86 (3.45)	30.38 (7.15)
Monarda spp.		0.18 (0.13)	0.65 (0.39)	0.60 (0.60)
Morus rubra		1.49 (1.17)	0.42 (0.22)	0.60 (0.25)
Ostrya virginiana		0.51 (0.51)	0.00	0.00
Oxalis spp.		0.00	0.05 (0.05)	0.00
Panicum spp.		0.00	0.78 (0.64)	0.68 (0.25)
Phytolacca americana	fruit	0.00	0.04 (0.04)	0.18 (0.18)
	leaves	0.98 (0.84)	1.22 (1.12)	4.05 (4.05)
Pinus spp.		2.04 (0.86)	1.32 (0.63)	0.61 (0.35)
Plantago spp.		0.00	0.07 (0.07)	0.07 (0.07)
Platanus occidentalis		0.74 (0.74)	0.16 (0.11)	0.00
Prunus spp.	fruit	0.00	0.78 (0.58)	0.31 (0.21)
	leaves	2.64 (0.57)	5.57 (3.23)	5.04 (1.11)
Quercus spp.	fruit	2.18 (1.84)	2.09 (1.20)	1.04 (0.34)

Table 6. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
	leaves	2.61 (1.53)	6.50 (2.51)	2.51 (1.15)
Rhus spp.	fruit	17.48 (0.31)	3.30 (1.91)	0.73 (0.17)
	leaves	7.51 (1.82)	7.17 (2.89)	8.01 (2.15)
Rosa spp.		0.00	1.34 (0.78)	0.20 (0.20)
Rubus spp.		3.57 (1.51)	5.95 (3.35)	1.52 (0.36)
Sida rhombifolia		0.00	0.04 (0.04)	0.00
Smilax spp.		3.47 (1.88)	3.02 (1.16)	4.20 (0.84)
Solidago spp.		3.59 (3.03)	3.82 (1.17)	1.25 (0.99)
Strophostiles spp.		0.06 (0.06)	0.00	0.00
Toxicodendron radicans		0.89 (0.39)	0.64 (0.32)	0.00
Trifolium reflexum		0.15 (0.15)	0.00	0.09 (0.09)
Ulmus spp.		0.00	0.54 (0.54)	0.00
Vaccinium spp.		0.26 (0.26)	0.00	0.00
Vitus spp.	fruit	0.07 (0.07)	0.00	0.01 (0.01)
	leaves	0.42 (0.42)	0.24 (0.14)	0.21 (0.21)
Unknown browse		2.02 (1.14)	2.85 (1.07)	5.20 (2.41)
Unknown composite		0.94 (0.29)	0.56 (0.19)	0.46 (0.23)
Unknown fern		0.45 (0.27)	0.15 (0.06)	1.05 (0.07)
Unknown forb		4.64 (3.16)	2.90 (1.71)	2.95 (0.80)
Unknown fruit		7.17 (0.95)	2.94 (0.84)	3.79 (1.10)
Unknown legume		2.83 (0.78)	6.36 (1.49)	6.19 (3.28)
Unknown grass		0.56 (0.38)	3.92 (3.60)	2.10 (1.11)

Table 6. Continued.

	Study Area		
Species	McCurtain	Howard	Pike
Unknown	3.93	4.67	4.28

[a]Standard error in parentheses.

Table 7. Estimates of percent species composition of February 1988 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Agropyron spicatum	0.00 [a]	0.00	0.51 (0.51)
Ambrosia spp.	0.05 (0.05)	0.00	0.00
Andropogon spp.	0.86 (0.51)	0.99 (0.53)	0.24 (.024)
Antennaria plantaginifolia	2.46 (1.90)	0.84 (0.45)	0.24 (0.13)
Aristida spp.	0.03 (0.03)	0.09 (0.09)	0.00
Bouteloua gracilis	0.67 (0.27)	0.00	0.00
Carex spp.	1.15 (0.51)	1.05 (0.96)	0.00
Chionanthus virginicus	0.43 (0.37)	0.00	0.00
Cornus spp.	4.69 (1.19)	8.35 (2.31)	3.58 (0.94)
Croton capitata	0.92 (0.92)	0.00	0.00
Euphorbia spp.	0.00	0.00	0.08 (0.08)
Elymus canadensis	0.26 (0.17)	0.13 (0.09)	0.11 (0.07)
Eragrostis spp.	0.04 (0.04)	0.31 (0.15)	0.41 (0.26)
Erigeron spp.	0.07 (0.07)	0.00	0.08 (0.08)
Eupatorium spp.	0.52 (0.32)	0.19 (0.19)	0.05 (0.05)
Fraxinus spp.	1.61 (0.77)	1.16 (1.09)	0.06 (0.06)
Ilex spp.	1.17 (0.89)	2.11 (1.18)	9.62 (5.68)
Juncus spp.	0.22 (0.22)	0.14 (0.14)	0.00
Juniperus virginiana	20.01 (8.25)	15.30 (6.23)	2.05 (1.81)

Table 7. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
Lepidium oblongatum		0.04 (0.04)	0.00	1.56 (1.19)
Lespedeza spp.		0.03 (0.03)	0.00	0.00
Lonicera spp./ Symphoricarpos orbiculatus		1.86 (1.37)	8.94 (8.19)	30.63(13.72)
Monarda spp.		0.29 (0.13)	0.00	0.00
Morus rubra		0.07 (0.07)	0.00	0.00
Panicum spp.		4.97 (2.14)	11.87 (6.13)	6.97 (4.23)
Phlox spp.		0.02 (0.02)	0.00	0.00
Pinus spp.		28.62 (8.66)	11.66 (7.45)	3.88 (2.44)
Plantago spp.		0.20 (0.11)	0.00	0.07 (0.07)
Polystichum acrostichoides		6.61 (3.20)	16.70 (10.51)	2.46 (1.31)
Prunus spp.	fruit	0.00	0.00	0.06 (0.06)
	leaves	0.00	0.00	0.04 (0.04)
Quercus spp.	fruit	0.08 (0.08)	0.04 (0.04)	0.12 (0.12)
	leaves	3.04 (2.65)	5.18 (1.48)	4.06 (0.81)
Rhus spp.	fruit	1.07 (0.68)	1.49 (1.49)	0.41 (0.41)
	leaves	4.88 (2.27)	0.55 (0.31)	2.06 (0.56)
Rosa spp.		0.00	0.00	0.66 (0.66)
Rubus spp.		0.22 (0.22)	0.37 (0.22)	2.66 (1.32)

Table 7. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Rudbeckia hirta	0.04 (0.04)	0.30 (0.30)	0.00
Smilax spp.	2.51 (0.90)	0.36 (0.14)	9.59 (3.58)
Solidago spp.	0.05 (0.05)	0.22 (0.22)	0.21 (0.15)
Toxicodendron radicans	0.09 (0.09)	0.00	0.32 (0.32)
Vaccinium spp.	0.00	0.26 (0.23)	1.97 (0.53)
Unknown browse	1.59 (0.50)	1.91 (0.62)	3.79 (0.71)
Unknown composite	0.15 (0.11)	0.81 (0.68)	0.00
Unknown fern	0.05 (0.05)	0.31 (0.27)	0.14 (0.14)
Unknown forb	1.78 (0.90)	0.47 (0.21)	0.59 (0.55)
Unknown fruit	0.88 (0.74)	1.45 (1.45)	1.59 (0.60)
Unknown legume	0.15 (0.12)	0.39 (0.32)	1.16 (0.72)
Unknown grass	3.68 (0.60)	2.31 (1.39)	1.59 (0.95)
Unknown	1.87	3.75	6.38

[a]Standard error in parentheses.

Table 8. Estimates of percent species composition of May 1988 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Abutilon threophrasti	6.94 (2.94)[a]	1.78 (1.15)	0.99 (0.34)
Acalypha gracilens	3.54 (1.59)	1.38 (0.39)	3.16 (1.37)
Agropyron spicatum	0.00	0.11 (0.11)	1.47 (1.47)
Alnus rugosa	0.00	0.00	0.17 (0.17)
Ambrosia spp.	0.01 (0.01)	0.00	0.00
Andropogon spp.	0.23 (0.23)	3.76 (1.70)	1.63 (0.97)
Antennaria plantaginifolia	0.90 (0.37)	0.44 (0.29)	0.43 (0.18)
Arundinaria gigantea	0.00	2.28 (1.33)	0.00
Bouteloua spp.	0.17 (0.17)	0.14 (0.14)	0.00
Callicarpa americana	1.75 (1.41)	1.47 (0.71)	1.65 (0.71)
Callirhoe digitata	6.45 (1.94)	3.24 (0.63)	4.12 (1.39)
Carex spp.	0.49 (0.29)	0.00	0.48 (0.48)
Cassia spp.	0.43 (0.27)	0.09 (0.09)	0.11 (0.11)
Ceanothus americanus	0.00	0.65 (0.29)	1.01 (1.01)
Chionanthus virginicus	0.00	0.00	0.06 (0.06)
Clitoria mariana	1.27 (0.66)	1.08 (0.71)	0.00

Table 8. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Cornus spp.	3.40 (1.65)	3.82 (1.03)	6.73 (1.27)
Croton capitatus	0.54 (0.54)	0.56 (0.56)	0.00
Cynoglossum amabile	0.16 (0.09)	0.00	0.07 (0.07)
Danthonia spicatum	0.00	0.00	0.43 (0.43)
Desmodium spp.	0.89 (0.61)	2.10 (0.76)	1.25 (0.69)
Elymus canadensis	0.27 (0.27)	0.00	0.52 (0.52)
Eragrostis spp.	0.58 (0.58)	0.29 (0.20)	0.17 (0.17)
Erigeron spp.	1.64 (0.38)	0.78 (0.78)	0.95 (0.63)
Eupatorium spp.	0.06 (0.06)	0.01 (0.01)	0.16 (0.16)
Euphorbia spp.	0.89 (0.59)	3.09 (2.19)	2.30 (1.47)
Geranium spp.	0.61 (0.18)	0.72 (0.49)	0.09 (0.09)
Gleditsia triacanthos	0.61 (0.42)	0.00	0.00
Hammamelis vernalis	0.21 (0.21)	1.58 (1.36)	0.00
Helianthus spp.	2.38 (1.50)	2.34 (1.10)	0.70 (0.50)
Hypericum spp.	0.08 (0.08)	1.14 (0.79)	0.08 (0.08)
Ilex spp.	0.00	0.00	0.72 (0.72)
Juncus spp.	0.00	0.35 (0.35)	0.22 (0.22)
Juniperus virginina	2.83 (2.83)	2.07 (2.07)	0.00
Lespedeza spp.	0.24 (0.24)	1.34 (0.95)	0.55 (0.37)

Table 8. Continued.

Species		Study Area		
		McCurtain	Howard	Pike
Lonicera spp./ Symphoricarpos orbiculatus		2.33 (0.54)	3.24 (1.58)	8.21 (4.45)
Monarda spp.		2.88 (0.69)	0.56 (0.22)	1.26 (1.01)
Myrica spp.		0.00	0.00	0.80 (0.60)
Oenothera lauvandulaefolia		1.05 (1.03)	0.17 (0.06)	0.08 (0.08)
Ostrya virginiana		2.32 (1.14)	1.13 (1.06)	1.21 (0.94)
Oxalis spp.		0.46 (0.17)	0.65 (0.25)	2.36 (1.24)
Panicum spp.		2.87 (1.03)	2.41 (0.75)	2.24 (1.53)
Phlox spp.		0.00	0.12 (0.12)	0.20 (0.13)
Pinus spp.		5.37 (0.67)	3.37 (1.28)	3.16 (1.30)
Plantago spp.		0.36 (0.21)	1.48 (1.23)	1.04 (0.63)
Platanus occidentalis		0.07 (0.07)	0.04 (0.04)	0.37 (0.37)
Potentilla spp.		0.00	0.20 (0.20)	0.13 (0.13)
Prunus spp.		3.84 (3.38)	0.93 (0.53)	2.83 (0.47)
Quercus spp.	fruit	2.40 (1.20)	1.82 (0.35)	2.06 (0.84)
	leaves	0.00	0.18 (0.18)	0.17 (0.17)
Rhus spp.	fruit	0.00	1.15 (1.15)	0.00
	leaves	2.95 (0.92)	10.48 (3.86)	7.03 (2.02)
Rosa spp.		0.00	0.13 (0.13)	0.00
Rubus spp.		3.40 (2.04)	2.56 (0.64)	6.04 (2.91)

Table 8. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Scutellaria ovata	0.20 (0.13)	0.00	0.00
Sida rhombifolia	0.48 (0.48)	0.00	0.15 (0.15)
Smilax spp.	1.48 (0.90)	1.36 (1.24)	4.28 (1.81)
Solidago spp.	0.40 (0.40)	0.44 (0.27)	0.57 (0.27)
Strophostiles spp.	1.07 (0.57)	1.40 (1.40)	0.92 (0.92)
Toxicodendron radicans	1.57 (0.54)	2.49 (1.06)	2.92 (1.09)
Trifolium reflexum	2.80 (0.97)	0.76 (0.57)	1.11 (0.53)
Vaccinium spp.	0.13 (0.13)	0.32 (0.32)	0.91 (0.54)
Verbascum thapsis	6.66 (2.70)	1.36 (1.36)	1.07 (0.86)
Vitus spp.	5.38 (2.38)	1.79 (1.10)	1.23 (0.56)
Unknown browse	1.34 (0.81)	2.11 (0.66)	0.76 (0.30)
Unknown composite	1.56 (0.70)	1.78 (0.33)	4.61 (2.14)
Unknown fern	0.93 (0.54)	1.55 (0.90)	0.00
Unknown forb	2.57 (0.86)	2.71 (1.66)	3.76 (2.60)
Unknown fruit	0.07 (0.07)	3.19 (2.18)	2.73 (0.96)
Unknown legume	2.02 (1.14)	6.16 (4.59)	1.51 (0.54)
Unknown grass	3.81 (1.74)	4.91 (1.81)	3.10 (0.55)
Unknown	0.00	0.44	0.96

[a]Standard error in parentheses.

Table 9. Estimates of percent species composition of August 1988 diets of white-tailed deer determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Study Area		
Species	McCurtain	Howard	Pike
Abutilon threophrasti	0.15 (0.15)[a]	0.42 (0.42)	0.00
Acalypha gracilens	1.04 (0.80)	0.00	0.33 (0.27)
Alnus rugosa	3.25 (1.88)	0.32 (0.31)	0.00
Ambrosia spp.	0.00	1.08 (1.04)	0.00
Andropogon spp.	0.94 (0.94)	0.54 (0.38)	2.74 (2.74)
Antennaria plantaginifolia	2.98 (1.30)	0.19 (0.14)	0.03 (0.03)
Aristida spp.	0.75 (0.59)	0.00	0.00
Bouteloua spp.	0.06 (0.06)	0.00	0.00
Callirhoe digitata	1.76 (0.47)	2.13 (0.82)	0.98 (0.98)
Carex spp.	1.11 (0.68)	0.00	0.26 (0.26)
Ceanothus americanus	0.00	0.00	0.08 (0.08)
Chionanthus virginicus	0.47 (0.47)	0.03 (0.03)	0.00
Clitoria mariana	1.50 (0.62)	0.67 (0.56)	0.27 (0.27)
Coreopsis spp.	0.00	0.06 (0.06)	0.00
Cornus spp.	5.47 (2.36)	4.10 (0.80)	2.99 (1.97)
Croton capitatus	2.48 (1.51)	2.06 (0.94)	2.20 (1.49)
Cynoglossum amabile	0.19 (0.19)	0.25 (0.22)	0.00

Table 9. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Danthonia spicatum	0.11 (0.11)	0.00	0.00
Desmodium spp.	0.29 (0.15)	0.02 (0.02)	0.56 (0.33)
Elymus canadensis	0.50 (0.31)	0.00	0.00
Eragrostis spp.	0.21 (0.21)	0.00	0.34 (0.34)
Erigeron spp.	0.00	0.83 (0.53)	0.00
Eupatorium spp.	0.11 (0.11)	0.69 (0.43)	0.35 (0.14)
Euphorbia spp.	0.09 (0.05)	1.28 (0.71)	2.70 (1.90)
Fraxinus spp.	0.12 (0.12)	0.08 (0.08)	0.14 (0.14)
Gelsemia spp.	0.13 (0.08)	1.60 (1.60)	0.00
Geranium spp.	0.00	0.89 (0.89)	0.12 (0.12)
Helianthus spp.	0.00	0.44 (0.44)	0.00
Hypericum spp.	0.00	0.59 (0.34)	0.52 (0.37)
Juniperus virginiana	3.49 (2.85)	0.00	0.00
Lespedeza spp.	0.41 (0.24)	0.95 (0.39)	0.00
Lonicera spp./ Symphoricarpos orbiculatus	2.65 (2.02)	6.65 (1.94)	2.58 (0.49)
Monarda spp.	0.16 (0.16)	2.96 (2.96)	0.08 (0.08)
Morus rubra	0.00	0.63 (0.63)	0.00
Myrica spp.	0.05 (0.05)	0.73 (0.73)	0.00
Oenothera lauvandulaefolia	0.02 (0.02)	0.02 (0.02)	0.00

Table 9. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Ostrya virginiana	0.14 (0.14)	0.51 (0.51)	0.00
Oxalis spp.	0.11 (0.05)	1.49 (1.17)	0.02 (0.02)
Panicum spp.	1.00 (0.30)	0.15 (0.15)	1.48 (1.38)
Phlox spp.	0.00	0.38 (0.38)	0.03 (0.03)
Phytolacca americana			
fruit	4.03 (1.68)	3.01 (2.62)	2.91 (0.76)
leaves	0.71 (0.71)	0.18 (0.18)	1.87 (1.87)
Pinus spp.	8.77 (5.59)	0.55 (0.16)	3.22 (2.18)
Plantago spp.	0.41 (0.26)	0.95 (0.81)	0.00
Platanus occidentalis	2.38 (1.29)	0.00	0.35 (0.35)
Potentilla spp.	0.06 (0.06)	0.00	0.06 (0.06)
Prunus spp.			
fruit	0.07 (0.07)	0.30 (0.22)	4.77 (2.26)
leaves	6.44 (1.28)	5.60 (1.73)	3.99 (1.87)
Psoralea spp.	0.00	0.40 (0.30)	0.24 (0.24)
Quercus spp.			
fruit	0.64 (0.38)	4.18 (2.72)	0.05 (0.05)
leaves	0.12 (0.12)	0.35 (0.35)	0.00
Rhus spp.			
fruit	0.02 (0.02)	0.43 (0.43)	0.39 (0.25)
leaves	12.61 (4.30)	14.59 (2.41)	1.46 (0.56)
Rosa spp.	1.58 (1.20)	1.28 (0.54)	0.16 (0.16)
Rubus spp.	2.77 (0.61)	2.63 (0.39)	12.30 (2.76)

Table 9. Continued.

Species	Study Area		
	McCurtain	Howard	Pike
Rudbeckia hirta	0.60 (0.42)	0.84 (0.29)	0.00
Scutellaria ovata	0.87 (0.87)	0.00	0.00
Sida rhombifolia	0.03 (0.03)	0.00	0.00
Smilax spp.	1.21 (0.65)	1.47 (0.46)	1.41 (0.71)
Solanum spp.	0.28 (0.21)	0.30 (0.30)	0.16 (0.16)
Solidago spp.	0.13 (0.08)	0.87 (0.16)	0.44 (0.26)
Strophostiles spp.	0.15 (0.11)	0.00	0.00
Toxicodendron radicans	3.93 (1.42)	6.28 (3.09)	0.27 (0.27)
Trifolium reflexum	0.16 (0.10)	0.29 (0.22)	0.00
Vaccinium spp.	0.12 (0.12)	0.66 (0.66)	0.28 (0.28)
Vitus spp. fruit	0.00	0.00	0.32 (0.32)
leaves	1.38 (0.21)	0.21 (0.21)	0.76 (0.44)
Unknown browse	3.33 (1.31)	4.82 (1.82)	15.41 (6.00)
Unknown composite	0.73 (0.46)	2.63 (1.24)	0.00
Unknown fern	0.28 (0.18)	0.00	0.31 (0.31)
Unknown forb	1.27 (0.35)	2.39 (1.40)	0.54 (0.23)
Unknown fruit	4.96 (1.58)	5.33 (1.82)	22.85 (3.47)
Unknown legume	4.24 (0.36)	2.95 (1.85)	2.20 (1.18)
Unknown grass	2.36 (0.70)	1.11 (0.81)	1.22 (0.47)
Unknown	1.62	2.66	3.26

[a]Standard error in parentheses.

Table 10. Estimates of percent species composition of October 1986 and February 1987 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma.

Species	Season	
	October 1986	February 1987
Andropogon spp.	8.48 (1.33)[a]	11.16 (3.29)
Andropogon virginicus	2.28 (0.81)	0.99 (0.23)
Antennaria plantaginifolia	0.13 (0.08)	0.16 (0.06)
Arundinaria gigantea	2.28 (1.20)	0.00
Aster spp.	0.18 (0.11)	0.15 (0.11)
Axonopus spp.	0.00	2.42 (2.08)
Bouteloua gracilis	0.00	0.88 (0.65)
Bromus spp.	0.47 (0.35)	0.12 (0.12)
Callirhoe digitata	0.00	0.11 (0.11)
Carex spp.	2.28 (1.16)	6.70 (3.03)
Clitoria mariana	1.25 (0.50)	0.39 (0.24)
Cornus spp.	1.37 (0.97)	3.49 (1.17)
Croton capitatus	2.22 (1.06)	0.00
Danthonia spicatum	0.16 (0.06)	3.40 (2.59)
Elymus canadensis	0.18 (0.11)	3.31 (1.44)
Eragrostis spp.	2.53 (0.99)	3.59 (2.61)
Eupatorium spp.	0.08 (0.08)	0.14 (0.14)
Hypericum spp.	0.49 (0.49)	0.50 (0.50)

Table 10. Continued.

Species	Season	
	October 1986	February 1987
Lespedeza spp.	1.73 (0.38)	0.13 (0.13)
Lonicera spp./ *Symphoricarpos orbiculatus*	0.15 (0.13)	0.21 (0.15)
Lycopodium spp.	0.45 (0.45)	0.00
Panicum spp.	21.47 (1.98)	10.30 (2.65)
Phytolacca americana fruit	0.87 (0.73)	0.00
Pinus spp.	2.76 (1.02)	7.74 (2.20)
Plantago spp.	3.39 (0.94)	3.45 (0.95)
Poa pratensis	0.00	3.56 (2.66)
Pycnanthemum spp.	0.15 (0.11)	0.01 (0.01)
Quercus spp. fruit	0.59 (0.33)	0.53 (0.36)
leaves	0.41 (0.27)	1.55 (1.09)
Rhus spp.	2.65 (0.81)	0.61 (0.35)
Rubus spp.	0.52 (0.31)	0.75 (0.56)
Smilax spp.	0.58 (0.58)	0.31 (0.31)
Solanum spp.	0.10 (0.10)	0.07 (0.07)
Solidago spp.	1.63 (0.63)	0.13 (0.13)
Sporobolus spp.	0.67 (0.29)	2.26 (2.26)
Uniola spp.	1.90 (0.90)	4.70 (1.57)
Unknown browse	2.56 (0.22)	0.32 (0.32)
Unknown composite	0.21 (0.09)	0.05 (0.05)

Table 10. Continued.

Species	Season	
	October 1986	February 1987
Unknown fern	0.32 (0.19)	0.09 (0.05)
Unknown forb	2.48 (0.91)	2.23 (1.43)
Unknown legume	3.56 (1.31)	0.28 (0.24)
Unknown grass	22.24 (1.39)	22.06 (0.48)
Unknown	4.23	1.15

[a]Standard error in parentheses.

Table 11. Estimates of percent species composition of May 1987 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Andropogon spp.	17.73 (1.46)[a]	15.72 (5.16)
Andropogon virginicus	1.72 (0.27)	24.46 (7.69)
Antennaria plantaginifolia	0.30 (0.15)	0.04 (0.01)
Aster spp.	0.04 (0.04)	0.12 (0.09)
Bouteloua gracilis	0.54 (0.39)	2.89 (1.34)
Callirhoe digitata	0.53 (0.32)	0.22 (0.14)
Carex spp.	4.75 (1.97)	1.32 (0.66)
Clitoria mariana	0.69 (0.09)	1.03 (0.83)
Cornus spp.	0.35 (0.23)	0.37 (0.19)
Cynoglossum amabile	1.85 (1.21)	0.63 (0.63)
Danthonia spicatum	0.81 (0.39)	0.30 (0.30)
Digitaria spp.	0.47 (0.47)	0.16 (0.16)
Elymus canadensis	0.03 (0.03)	0.77 (0.49)
Eragrostis spp.	2.83 (0.66)	0.52 (0.36)
Festuca spp.	1.61 (0.40)	0.00
Gelsemia spp.	0.05 (0.03)	1.13 (0.59)
Lespedeza spp.	1.45 (0.26)	5.81 (1.08)

Table 11. Continued.

Species	Study area	
	McCurtain	Howard
Lonicera spp./ Symphoricarpos orbiculatus	0.29 (0.23)	0.38 (0.13)
Oxalis spp.	0.31 (0.11)	0.02 (0.02)
Panicum spp.	18.90 (2.22)	10.41 (2.40)
Pinus spp.	2.06 (1.29)	0.26 (0.19)
Plantago spp.	2.10 (1.29)	1.76 (0.40)
Prunus spp.	0.71 (0.35)	0.14 (0.05)
Quercus spp. fruit	0.48 (0.26)	0.00
Rhus spp.	2.58 (1.00)	0.13 (0.05)
Scutellaria ovata	0.08 (0.08)	0.08 (0.08)
Smilax spp.	0.29 (0.29)	0.23 (0.11)
Solanum spp.	0.19 (0.14)	0.53 (0.23)
Solidago spp.	0.16 (0.06)	0.00
Sporobolus spp.	2.61 (0.99)	1.93 (0.70)
Strophostiles spp.	0.49 (0.34)	0.03 (0.03)
Uniola spp.	1.15 (0.35)	0.99 (0.69)
Unknown browse	0.42 (0.36)	0.02 (0.02)
Unknown composite	1.50 (0.89)	0.56 (0.18)
Unknown forb	4.01 (0.89)	7.66 (1.95)
Unknown legume	3.40 (0.56)	4.11 (1.03)

Table 11. Continued.

	Study area	
Species	McCurtain	Howard
Unknown grass	18.08 (1.52)	11.02 (3.09)
Unknown	4.44	4.25

[a]Standard error in parentheses.

Table 12. Estimates of percent species composition of August 1987 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Andropogon spp.	9.54 (1.32)[a]	18.10 (3.78)
Andropogon virginicus	0.80 (0.63)	38.52 (6.45)
Antennaria plantaginifolia	0.19 (0.06)	0.00
Aristida spp.	0.41 (0.17)	0.18 (0.08)
Arundinaria gigantea	0.46 (0.19)	0.71 (0.64)
Bouteloua gracilis	0.64 (0.40)	2.14 (0.73)
Bromus spp.	0.66 (0.66)	0.13 (0.13)
Callirhoe digitata	0.39 (0.21)	0.00
Carex spp.	2.96 (1.06)	1.42 (0.75)
Clitoria mariana	0.98 (0.50)	0.00
Cynoglossum amabile	0.44 (0.30)	0.00
Danthonia spicatum	1.48 (0.31)	2.05 (0.66)
Elymus canadensis	0.96 (0.91)	0.14 (0.05)
Eragrostis spp.	1.38 (0.72)	5.93 (2.20)
Festuca spp.	1.69 (1.01)	1.09 (0.45)
Lespedeza spp.	7.09 (1.17)	0.14 (0.08)

Table 12. Continued.

Species		Study area: McCurtain	Study area: Howard
Lonicera spp./ *Symphoricarpos orbiculatus*		0.56 (0.25)	0.06 (0.06)
Melica spp.		0.58 (0.24)	0.45 (0.24)
Morus rubra		0.07 (0.07)	0.00
Oxalis spp.		0.11 (0.08)	1.92 (1.92)
Panicum spp.		10.91 (0.86)	1.82 (0.68)
Pinus spp.		2.57 (1.40)	0.34 (0.20)
Plantago spp.		8.64 (3.62)	0.00
Pycnanthemum spp.		0.10 (0.10)	0.00
Quercus spp.	fruit	0.70 (0.39)	0.21 (0.11)
	leaves	0.11 (0.11)	0.00
Rhus spp.	fruit	0.14 (0.14)	0.00
	leaves	0.46 (0.14)	0.00
Rudbeckia hirta		0.12 (0.12)	0.00
Solanum spp.		0.00	0.09 (0.05)
Sorghum bicolor		0.09 (0.06)	8.91 (4.47)
Sporobolus spp.		0.41 (0.17)	1.43 (1.36)
Strophostiles spp.		0.66 (0.24)	0.00
Uniola spp.		1.17 (0.76)	1.38 (1.32)
Verbascum thapsis		0.19 (0.19)	0.00

Table 12. Continued.

	Study area	
Species	McCurtain	Howard
Unknown browse	0.64 (0.36)	0.00
Unknown composite	0.35 (0.12)	0.00
Unknown forb	2.97 (0.61)	0.69 (0.36)
Unknown legume	2.85 (1.21)	0.22 (0.09)
Unknown grass	30.97 (2.65)	11.07 (0.95)
Unknown	4.56	0.86

[a]Standard error in parentheses.

Table 13. Estimates of percent species composition of October 1987 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Andropogon spp.	6.18 (0.91)[a]	15.27 (3.53)
Andropogon virginicus	0.18 (0.11)	0.26 (0.21)
Antennaria plantaginifolia	0.05 (0.03)	0.00
Arundinaria gigantea	1.36 (0.54)	0.68 (0.55)
Bouteloua gracilis	5.79 (5.18)	5.13 (3.53)
Carex spp.	2.16 (0.53)	9.87 (1.69)
Ceanothus americanus	0.80 (0.80)	0.00
Clitoria mariana	1.18 (0.55)	0.00
Cornus spp.	2.11 (0.59)	0.03 (0.03)
Croton capitatus	0.38 (0.20)	0.52 (0.21)
Cynoglossum amabile	0.29 (0.29)	0.04 (0.04)
Desmodium spp.	2.11 (0.98)	0.00
Digitaria spp.	0.34 (0.34)	0.46 (0.46)
Eragrostis spp.	3.37 (1.45)	1.90 (0.69)
Eupatorium spp.	0.03 (0.03)	0.20 (0.14)
Festuca spp.	0.25 (0.09)	2.09 (0.95)
Gelsemia spp.	0.66 (0.66)	0.00
Hypericum spp.	0.29 (0.29)	0.00

Table 13. Continued.

Species	Study area	
	McCurtain	Howard
Lespedeza spp.	1.81 (0.83)	1.09 (0.54)
Lonicera spp./ *Symphoricarpos orbiculatus*	0.41 (0.24)	0.31 (0.27)
Panicum spp.	24.08 (4.03)	20.71 (4.12)
Phytolacca americana fruit	0.05 (0.05)	0.27 (0.22)
Pinus spp.	3.61 (2.67)	0.07 (0.07)
Plantago spp.	10.82 (6.10)	0.82 (0.43)
Quercus spp. fruit	0.11 (0.07)	0.00
Rhus spp. fruit	0.59 (0.59)	0.00
leaves	2.49 (1.31)	0.29 (0.23)
Rubus spp.	0.13 (0.08)	0.04 (0.04)
Solanum spp.	0.05 (0.05)	0.00
Solidago spp.	1.60 (0.52)	7.44 (1.40)
Sorghum bicolor	0.87 (0.45)	0.00
Sporobolus spp.	0.37 (0.37)	0.00
Uniola spp.	0.09 (0.06)	10.87 (5.61)
Vaccinium spp.	0.17 (0.17)	0.21 (0.21)
Verbascum thapsis	0.11 (0.11)	0.06 (0.06)
Unknown browse	1.44 (4.04)	0.15 (0.15)
Unknown composite	0.05 (0.05)	0.68 (0.28)

Table 13. Continued.

	Study area	
Species	McCurtain	Howard
Unknown forb	2.37 (0.54)	2.80 (1.52)
Unknown fruit	0.26 (0.06)	0.15 (0.05)
Unknown legume	3.87 (1.58)	1.81 (0.72)
Unknown grass	14.21 (2.05)	12.90 (1.98)
Unknown	2.91	2.88

[a]Standard error in parentheses.

Table 14. Estimates of percent species composition of February 1988 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Andropogon virginicus	5.98 (2.21)[a]	23.57 (2.60)
Aristida spp.	1.63 (0.75)	0.75 (0.28)
Arundinaria gigantea	1.74 (0.97)	0.00
Axonipus spp.	0.02 (0.02)	3.94 (1.04)
Bouteloua gracilis	3.28 (2.86)	1.86 (0.60)
Callirhoe digitata	0.62 (0.62)	0.00
Carex spp.	2.04 (1.44)	9.92 (2.16)
Cornus spp.	2.97 (2.54)	0.27 (0.17)
Croton capitatus	0.15 (0.15)	0.07 (0.07)
Cynoglossum amabile	1.00 (1.00)	1.26 (0.74)
Danthonia spicatum	0.84 (0.57)	0.22 (0.13)
Elymus canadensis	9.58 (2.84)	0.74 (0.46)
Eragrostis spp.	3.57 (1.03)	3.05 (0.70)
Festuca spp.	3.98 (1.73)	0.13 (0.13)
Fraxinus spp.	0.16 (0.09)	0.02 (0.02)
Hypericum spp.	0.33 (0.27)	0.00
Juniperus virginiana	0.30 (0.30)	0.00
Lespedeza spp.	0.06 (0.03)	0.03 (0.03)

Table 14. Continued.

Species	Study area	
	McCurtain	Howard
Lonicera spp./ *Symphoricarpos orbiculatus*	0.75 (0.75)	0.22 (0.15)
Panicum spp.	8.12 (1.71)	9.38 (1.01)
Phytolacca americana fruit	0.20 (0.16)	0.55 (0.45)
Pinus spp.	13.28 (3.90)	1.43 (0.21)
Plantago spp.	0.05 (0.05)	0.88 (0.37)
Quercus spp. fruit	0.17 (0.06)	0.03 (0.03)
leaves	0.48 (0.34)	1.50 (0.54)
Rhus spp.	1.60 (1.05)	0.71 (0.62)
Solanum spp.	0.09 (0.09)	0.00
Sporobolus spp.	2.50 (1.63)	0.92 (0.45)
Uniola spp.	2.17 (1.25)	9.58 (3.34)
Vitus spp.	0.36 (0.23)	0.06 (0.06)
Unknown browse	1.08 (0.14)	0.89 (0.43)
Unknown composite	0.49 (0.49)	0.00
Unknown fern	0.05 (0.05)	0.19 (0.14)
Unknown forb	5.99 (0.91)	0.67 (0.27)
Unknown fruit	0.04 (0.04)	0.15 (0.15)
Unknown grass	18.85 (2.72)	22.94 (1.59)
Unknown	5.48	4.07

[a]Standard error in parentheses.

Table 15. Estimates of percent species composition of May 1988 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Abutilon threophrasti	0.51 (0.25)[a]	0.09 (0.09)
Andropogon spp.	12.70 (0.62)	18.07 (1.71)
Andropogon virginicus	0.84 (0.29)	7.08 (2.55)
Antennaria plantaginifolia	0.37 (0.22)	0.06 (0.02)
Aristida spp.	1.19 (0.54)	0.23 (0.10)
Aster spp.	0.16 (0.09)	0.18 (0.16)
Axonipus spp.	0.80 (0.54)	0.56 (0.51)
Bouteloua gracilis	0.41 (0.26)	2.83 (2.20)
Bromus spp.	0.19 (0.19)	0.68 (0.63)
Callirhoe digitata	0.29 (0.13)	0.31 (0.18)
Carex spp.	5.08 (1.67)	6.08 (2.36)
Clitoria mariana	1.56 (0.77)	0.21 (0.05)
Cornus spp.	0.19 (0.14)	0.15 (0.06)
Croton capitatus	0.49 (0.49)	0.18 (0.13)
Cynoglossum amabile	0.88 (0.52)	0.97 (0.32)
Danthonia spicatum	0.71 (0.05)	0.46 (0.34)
Elymus canadensis	0.56 (0.50)	0.00

Table 15. Continued.

Species	Study area	
	McCurtain	Howard
Eragrostis spp.	2.27 (0.55)	4.80 (1.10)
Eupatorium spp.	0.00	0.23 (0.15)
Festuca spp.	1.54 (1.05)	0.65 (0.26)
Gelsemia spp.	0.16 (0.16)	0.40 (0.16)
Geranium spp.	0.07 (0.07)	0.19 (0.12)
Lespedeza spp.	2.29 (0.65)	2.92 (0.40)
Lonicera spp./ Symphoricarpos orbiculatus	0.19 (0.14)	0.43 (0.15)
Oxalis spp.	0.10 (0.07)	0.13 (0.06)
Panicum spp.	14.48 (3.78)	9.77 (0.70)
Pinus spp.	2.93 (1.31)	0.23 (0.14)
Plantago spp.	5.33 (0.88)	4.92 (1.78)
Prunus spp.	0.17 (0.11)	0.02 (0.02)
Pycnanthemum spp.	0.87 (0.33)	0.55 (0.30)
Quercus spp.		
fruit	0.09 (0.05)	0.02 (0.02)
leaves	0.05 (0.05)	0.00
Rhus spp.	0.62 (0.28)	0.35 (0.07)
Rubus spp.	0.12 (0.10)	0.41 (0.38)
Scutellaria spp.	0.42 (0.29)	0.22 (0.08)
Smilax spp.	0.00	0.17 (0.17)
Solanum spp.	0.08 (0.08)	0.00
Solidago spp.	0.64 (0.44)	0.00

Table 15. Continued.

Species	Study area	
	McCurtain	Howard
Sorghum bicolor	0.18 (0.12)	1.24 (0.08)
Sporobolus spp.	7.94 (2.76)	3.03 (0.31)
Uniola spp.	0.77 (0.37)	4.23 (2.25)
Unknown browse	0.26 (0.21)	0.00
Unknown composite	0.98 (0.45)	2.42 (0.95)
Unknown fern	0.65 (0.55)	0.13 (0.13)
Unknown forb	5.42 (1.48)	3.96 (1.14)
Unknown fruit	0.87 (0.45)	0.27 (0.10)
Unknown grass	15.53 (0.78)	10.71 (0.43)
Unknown	8.05	9.46

[a]Standard error in parentheses.

Table 16. Estimates of percent species composition of August 1988 diets of cattle determined microhistologically from feces collected in McCurtain County, Oklahoma, and Howard County, Arkansas.

	Study area	
Species	McCurtain	Howard
Andropogon spp.	9.85 (2.14)[a]	11.46 (2.29)
Andropogon virginicus	2.11 (1.17)	25.62 (5.59)
Antennaria plantaginifolia	0.12 (0.07)	0.00
Aristida spp.	0.74 (0.46)	0.47 (0.32)
Arundinaria gigantea	3.37 (1.42)	0.15 (0.05)
Bouteloua gracilis	2.50 (1.64)	2.29 (0.73)
Carex spp.	2.15 (0.56)	0.92 (0.17)
Ceanothus americanus	0.30 (0.18)	0.08 (0.08)
Clitoria mariana	0.52 (0.27)	0.31 (0.17)
Cornus spp.	0.04 (0.04)	0.08 (0.08)
Croton capitatus	2.27 (0.65)	1.48 (0.40)
Cynoglossum amabile	0.14 (0.09)	0.12 (0.12)
Danthonia spicatum	0.91 (0.16)	1.02 (0.21)
Elymus canadensis	2.72 (1.16)	0.00
Eragrostis spp.	3.35 (0.71)	2.02 (0.51)
Festuca spp.	2.08 (0.80)	7.63 (1.18)
Lespedeza spp.	2.82 (0.60)	2.46 (0.51)

Table 16. Continued.

Species	Study area	
	McCurtain	Howard
Lonicera spp./ Symphoricarpos orbiculatus	0.23 (0.23)	0.23 (0.23)
Oxalis spp.	0.06 (0.04)	0.04 (0.04)
Panicum spp.	16.06 (2.42)	7.30 (1.76)
Phytolacca americana fruit	0.05 (0.05)	0.12 (0.12)
Pinus spp.	2.60 (0.74)	0.17 (0.10)
Plantago spp.	3.34 (1.72)	2.21 (1.24)
Quercus spp. fruit	0.15 (0.05)	0.15 (0.12)
leaves	0.16 (0.16)	0.00
Rhus spp.	1.41 (0.76)	0.07 (0.04)
Sida rhombifolia	0.02 (0.02)	0.02 (0.02)
Solanum spp.	0.28 (0.09)	0.44 (0.19)
Solidago spp.	0.17 (0.10)	0.03 (0.03)
Sorghum bicolor	0.96 (0.72)	2.28 (1.54)
Sporobolus spp.	0.29 (0.17)	4.66 (0.82)
Toxicodendron radicans	0.06 (0.06)	0.00
Uniola spp.	1.06 (0.68)	0.47 (0.47)
Unknown composite	0.32 (0.08)	0.17 (0.17)
Unknown forb	3.21 (1.25)	1.68 (0.54)
Unknown fruit	0.17 (0.17)	0.00

Table 16. Continued.

	Study area	
Species	McCurtain	Howard
Unknown grass	24.46 (2.96)	16.56 (1.05)
Unknown	8.95	7.29

[a]Standard error in parentheses.

Table 17. Percent dietary composition by forage class of white-tailed deer and cattle feces collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Deer			Cattle	
Season	McCurtain	Howard	Pike	McCurtain	Howard
		October 1986			
Browse	44.28	42.15	48.40	8.24	----
Forb	22.58	21.70	20.76	17.60	----
Mast	19.97	26.23	21.24	1.46	----
Conifer	9.09	2.95	3.72	2.76	----
Grass	3.81	5.39	3.82	64.94	----
Fern	0.00	0.86	0.81	0.77	----
Other	0.27	0.72	1.25	4.23	----
		February 1987			
Browse	35.28	55.15	56.49	7.24	----
Forb	18.16	14.65	4.96	7.80	----
Mast	5.13	13.54	16.92	0.53	----
Conifer	11.13	6.00	5.51	7.74	----
Grass	16.30	9.19	13.31	75.45	----
Fern	13.87	1.47	2.06	0.09	----
Other	0.13	0.00	0.75	1.15	----
		May 1987			
Browse	38.28	37.80	42.22	4.64	1.27
Forb	35.02	47.62	38.60	17.15	23.73
Mast	1.24	4.25	5.54	0.48	0.00
Conifer	8.70	2.00	3.08	2.06	0.26

Table 17. Continued.

	Deer			Cattle	
Season	McCurtain	Howard	Pike	McCurtain	Howard
		May 1987			
Grass	3.42	4.62	6.97	71.23	70.49
Fern	5.08	0.99	1.13	0.00	0.00
Other	8.26	2.72	2.46	4.44	4.25
		August 1987			
Browse	40.94	53.32	62.07	1.84	0.06
Forb	37.63	32.79	11.76	25.08	3.06
Mast	14.13	9.55	14.83	0.84	0.21
Conifer	2.55	0.87	1.61	2.57	0.34
Grass	1.56	0.29	5.56	65.11	95.47
Fern	0.12	0.17	0.07	0.00	0.00
Other	3.07	3.01	4.10	4.56	0.86
		October 1987			
Browse	47.09	53.52	66.96	7.55	1.03
Forb	14.75	19.72	14.82	25.67	15.46
Mast	26.90	9.15	6.06	1.01	0.42
Conifer	2.04	1.32	0.61	3.61	0.07
Grass	4.84	11.47	6.22	59.25	80.14
Fern	0.45	0.15	1.05	0.00	0.00
Other	3.93	4.67	4.28	2.91	2.88
		February 1988			
Browse	22.16	29.19	69.04	7.40	3.67

Table 17. Continued.

	Deer			Cattle	
Season	McCurtain	Howard	Pike	McCurtain	Howard
Forb	6.73	3.22	2.48	8.78	2.91
Mast	2.03	2.98	2.18	0.41	0.73
Conifer	48.63	26.96	5.93	13.58	1.43
Grass	11.92	16.89	11.39	64.30	87.00
Fern	6.66	17.01	2.60	0.05	0.73
Other	1.87	3.75	6.38	5.48	4.07
		May 1988			
Browse	34.00	35.66	50.26	1.60	1.53
Forb	46.00	36.50	30.57	20.62	17.94
Mast	2.47	6.16	4.79	0.96	0.29
Conifer	8.20	5.44	3.16	2.93	0.23
Grass	8.40	14.25	10.26	65.19	70.42
Fern	0.93	1.55	0.00	0.65	0.13
Other	0.00	0.44	0.96	8.05	9.46
		August 1988			
Browse	49.77	51.12	44.38	2.20	0.46
Forb	19.31	30.62	11.50	13.10	8.96
Mast	9.72	13.25	31.29	0.37	0.27
Conifer	12.26	0.55	3.22	2.60	0.17
Grass	7.04	1.80	6.04	72.61	82.85
Fern	0.28	0.00	0.31	0.00	0.00
Other	1.62	2.66	3.26	8.95	7.29

Table 18. Percent dietary overlap by season of collection for deer in McCurtain County, Oklahoma and Howard and Pike counties, Arkansas.

Season	McCurtain-Howard (deer)	McCurtain-Pike (deer)	Howard-Pike (deer)	McCurtain (deer-cattle)	Howard (deer-cattle)
October 1986	61.6	64.3	64.4	21.8	---
February 1987	54.8	38.9	47.9	31.2	---
May 1987	57.4	59.0	62.7	20.7	14.8
August 1987	66.8	40.2	52.7	16.7	2.5
October 1987	57.0	43.9	60.4	14.0	16.4
February 1988	61.7	34.2	43.2	34.6	20.1
May 1988	62.0	59.0	66.0	21.5	22.1
August 1988	62.2	43.5	41.7	17.6	8.4

Table 19. Fecal nitrogen (%) of deer and cattle feces collected from McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Deer			Cattle	
Season	McCurtain	Howard	Pike	McCurtain	Howard
October 1986	2.47 (0.14)[a]	2.12 (0.11)	2.40 (0.12)	1.94 (0.06)	----
February 1987	1.99 (0.09)	1.95 (0.11)	2.15 (0.09)	1.64 (0.18)	----
May 1987	2.91 (0.23)	3.29 (0.20)	2.91 (0.16)	2.22 (0.06)	2.28 (0.03)
August 1987	2.52 (0.12)	2.27 (0.16)	2.15 (0.12)	1.85 (0.04)	1.56 (0.05)
October 1987	2.52 (0.05)	2.65 (0.02)	2.24 (0.10)	1.68 (0.03)	1.37 (0.02)
February 1988	1.96 (0.04)	1.95 (0.07)	2.18 (0.07)	1.42 (0.03)	1.17 (0.01)
May 1988	3.22 (0.14)	3.22 (0.22)	3.05 (0.19)	2.32 (0.06)	2.35 (0.05)
August 1988	2.77 (0.07)	2.83 (0.11)	2.17 (0.10)	2.00 (0.06)	1.74 (0.05)
October 1988	2.61 (0.19)	2.62 (0.30)	2.26 (0.08)	1.80 (0.07)	----

[a]Standard error in parentheses.

Table 20. Fecal RNA (%) of deer and cattle feces collected from McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

	Deer			Cattle	
Season	McCurtain	Howard	Pike	McCurtain	Howard
October 1986	0.1589 (0.0109)[a]	0.1438 (0.0056)	0.1524 (0.0059)	0.0854 (0.0070)	----
February 1987	0.1084 (0.0080)	0.0933 (0.0095)	0.1335 (0.0164)	0.0558 (0.0137)	----
May 1987	0.1189 (0.0071)	0.1619 (0.0091)	0.1140 (0.0051)	0.0982 (0.0045)	0.0548 (0.0024)
August 1987	0.0828 (0.0122)	0.0786 (0.0040)	0.0566 (0.0077)	0.0496 (0.0059)	0.0580 (0.0058)
October 1987	0.1044 (0.0055)	0.0825 (0.0105)	0.0616 (0.0087)	0.0675 (0.0043)	0.0504 (0.0055)
February 1988	0.0863 (0.0035)	0.1148 (0.0116)	0.0750 (0.0033)	0.0428 (0.0052)	0.0331 (0.0037)
May 1988	0.1663 (0.0127)	0.1689 (0.0125)	0.1877 (0.0270)	0.0798 (0.0058)	0.0785 (0.0020)
August 1988	0.0918 (0.0059)	0.1035 (0.0139)	0.0471 (0.0029)	0.0642 (0.0038)	0.0415 (0.0019)
October 1988	0.0749 (0.0128)	0.0641 (0.0065)	0.0587 (0.0123)	0.0497 (0.0032)	----

[a]Standard error in parentheses.

Table 21. Total number of white-tailed deer collected in McCurtain County, Oklahoma and Howard and Pike counties, Arkansas in February and August 1987 and 1988.

Time of Collection		Study Area			
Sex	Age	McCurtain	Howard	Pike	Total
February 1987					
Female	Adult	3	3	1	7
	Fawn	1	2	3	6
Male	Adult	1	0	0	1
	Fawn	1	0	2	3
August 1987					
Female	Adult	5	5	5	15
Male	Adult	2	0	0	2
February 1988					
Female	Adult	5	5	5	15
	Fawn	2	2	0	4
Male	Adult	2	0	4	6
	Fawn	0	0	4	4
August 1988					
Female	Adult	5	5	5	15
Male	Adult	1	6	7	14

Table 22. Carcass weight and femur marrow fat of female white-tailed deer collected in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas in February and August, 1987 and 1988.

		Study Area		
		McCurtain	Howard	Pike
Carcass Weight (kg)				
Season				
Feb	N	11	12	9
	$\bar{X}$	24.6A[a,b]	25.3A	27.7B
	SE	1.8	2.3	1.9
Aug	N	10	10	10
	$\bar{X}$	28.2A	31.3B	30.2AB
	SE	1.0	1.3	1.6
Femur Marrow Fat (%)				
Both	N	21	22	19
	$\bar{X}$	44.3A	50.6A	59.9B
	SE	3.5	3.8	3.3
Fetuses/Doe				
Feb	N	8	8	6
	$\bar{X}$	1.24A	1.48A	2.00B
	SE	0.25	0.18	0.00

[a]Means within a category with the same letter are not different ($P > 0.05$) using Analysis of Covariance (carcass weight) and Analysis of Variance (femur fat).

[b]H_o: Pike = McCurtain + Howard (i.e., cattle vs. no cattle).

Table 23. Albumin, globulin, albumin/globulin ratio, glucose, blood urea nitrogen (BUN), creatinine, BUN/creatinine ratio, calcium, phosphorus, and calcium/phosphorus ratio in blood serum of female white-tailed deer collected in McCurtain County, Oklahoma and Howard and Pike counties, Arkansas in February and August, 1987 and 1988.

Serum Character	Season	N	Study Area McCurtain	Howard	Pike
Albumin	Both	61	3.44A[a]	3.97B	3.62AB
(g/dl)			(0.17)[b,c]	(0.16)	(0.15)
Globulin	Both	61	3.40A	3.06A	3.23A
(g/dl)			(0.23)	(0.27)	(0.24)
Albumin/ Globulin Ratio	Both	61	1.18A	1.58B	1.35AB
			(0.16)	(0.20)	(0.22)
Glucose	Feb	31	165.83A	140.50A	229.38A
(mg/dl)			(29.50)	(16.32)	(75.64)
	Aug	30	92.27A	131.83B	99.63AB
			(8.88)	(11.02)	(6.73)
BUN	Feb	31	22.94A	25.25A	22.31A
(mg/dl)			(3.12)	(2.60)	(3.02)
	Aug	30	12.22A	9.37A	6.77B
			(1.88)	(0.89)	(0.46)
Creatinine	Both	61	1.48A	1.48A	1.54A
(mg/dl)			(0.04)	(0.05)	(0.10)
BUN/ Creatinine Ratio	Both	61	12.34A	12.02A	8.65B
			(1.59)	(1.51)	(1.06)

Table 23. Continued.

Serum Character	Season	N	Study Area McCurtain	Howard	Pike
Calcium	Both	61	10.40A	11.00A	11.11A
(mg/dl)			(0.40)	(0.38)	(0.60)
Phosphorus	Both	61	11.01A	11.72A	10.45B
(mg/dl)			(0.59)	(0.50)	(0.92)
Calcium/ Phosphorus Ratio	Both	61	0.98A	0.96A	1.14B
			(0.05)	(0.04)	(0.07)

[a]Means within a category with the same letter are not different ($P > 0.05$) using Analysis of Variance.

[b]Standard error in parentheses.

[c]H_o: Pike = McCurtain + Howard (i.e., cattle vs. no cattle).

Table 24. Ranks[a] of characteristics of deer collected from McCurtain County, Oklahoma and Howard and Pike counties, Arkansas in February and August, 1987 and 1988.

		Study Area		
Index	Season	McCurtain	Howard	Pike
Carcass Weight	Feb	1	1	3
	Aug	1	3	2
Femur Fat	Both	1	1	3
Fetuses/ Doe	Feb	1	1	3
Albumin	Both	1	3	2
Albumin/ Globulin Ratio	Both	1	3	2
BUN	Aug	3	3	1
BUN/ Creatinine Ratio	Both	3	3	1
Phosphorus	Both	3	3	1
Calcium/ Phosphorus Ratio	Both	1	1	3
Glucose	Aug	1	3	2
TOTAL RANK	Feb	12	16	18
	Aug	15	23	17

[a]Means of characteristics received ranks of 3 when significantly higher, 2 when intermediate and not different from other populations, and 1 when significantly lower than another population.

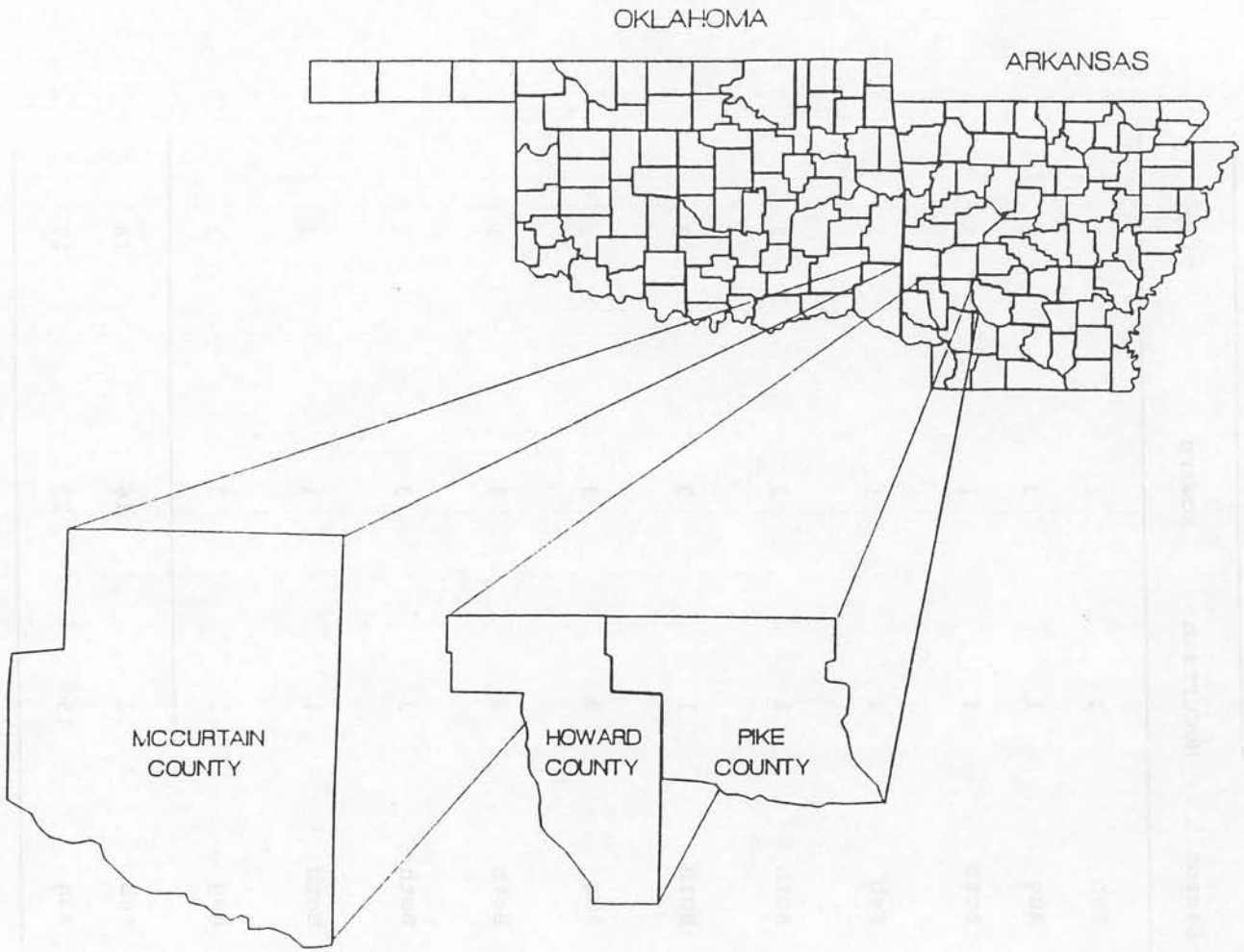

Fig. 1. Locations of the three study areas in McCurtain County, Oklahoma, and Howard and Pike counties, Arkansas.

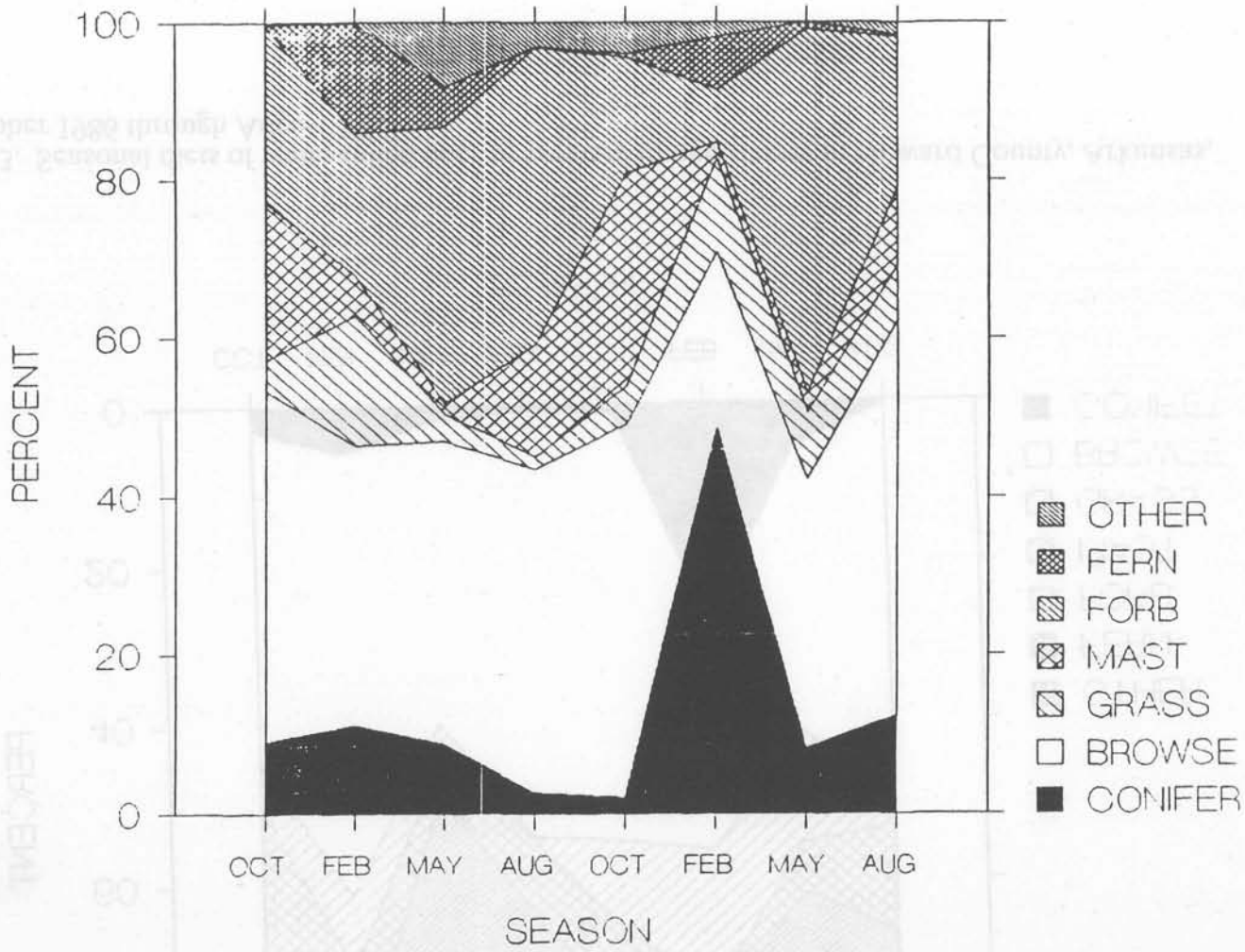

Fig. 2. Seasonal diets of white-tailed deer by primary forage classes in McCurtain County, Oklahoma, October 1986 through August 1988.

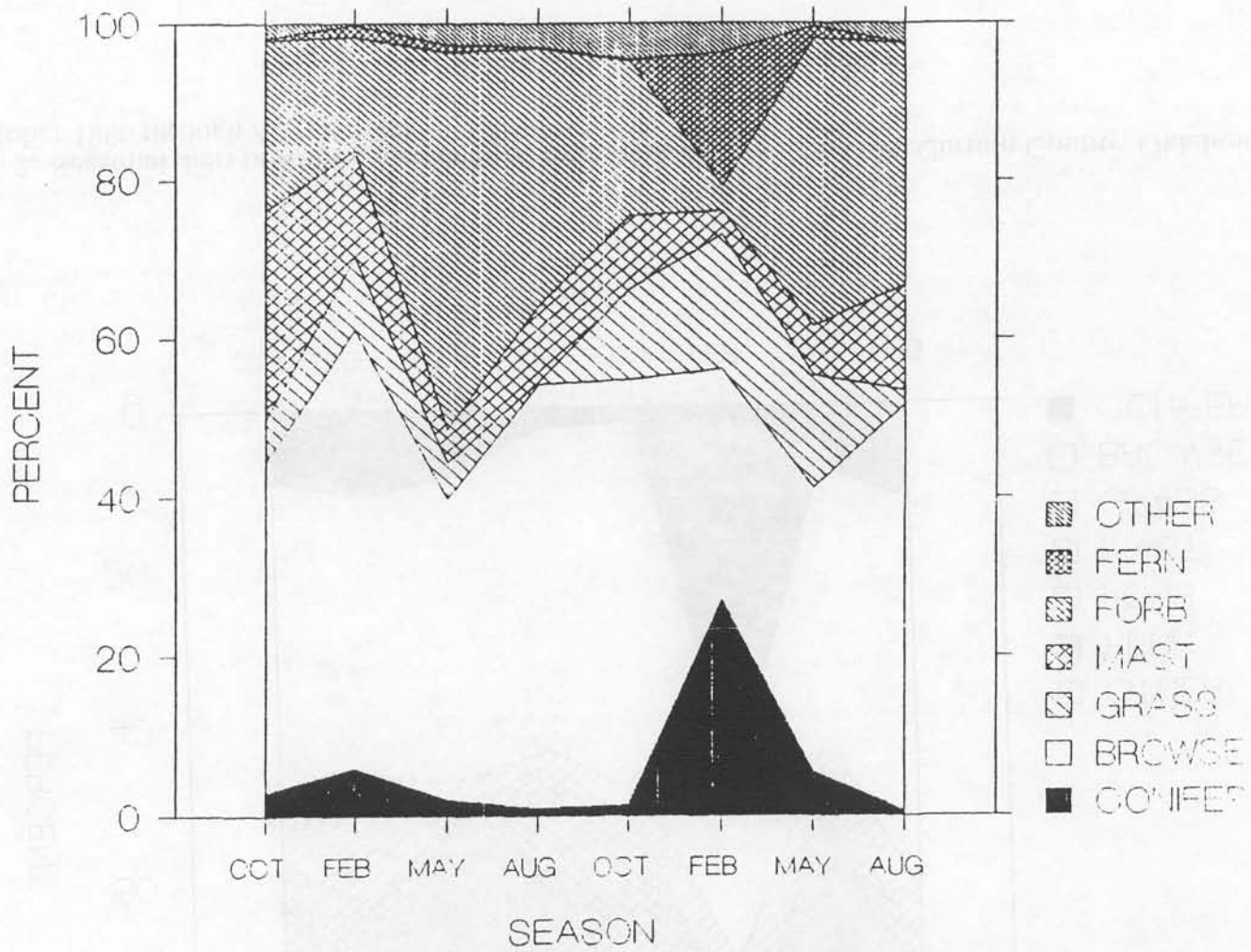

Fig. 3. Seasonal diets of white-tailed deer by primary forage classes in Howard County, Arkansas, October 1986 through August 1988.

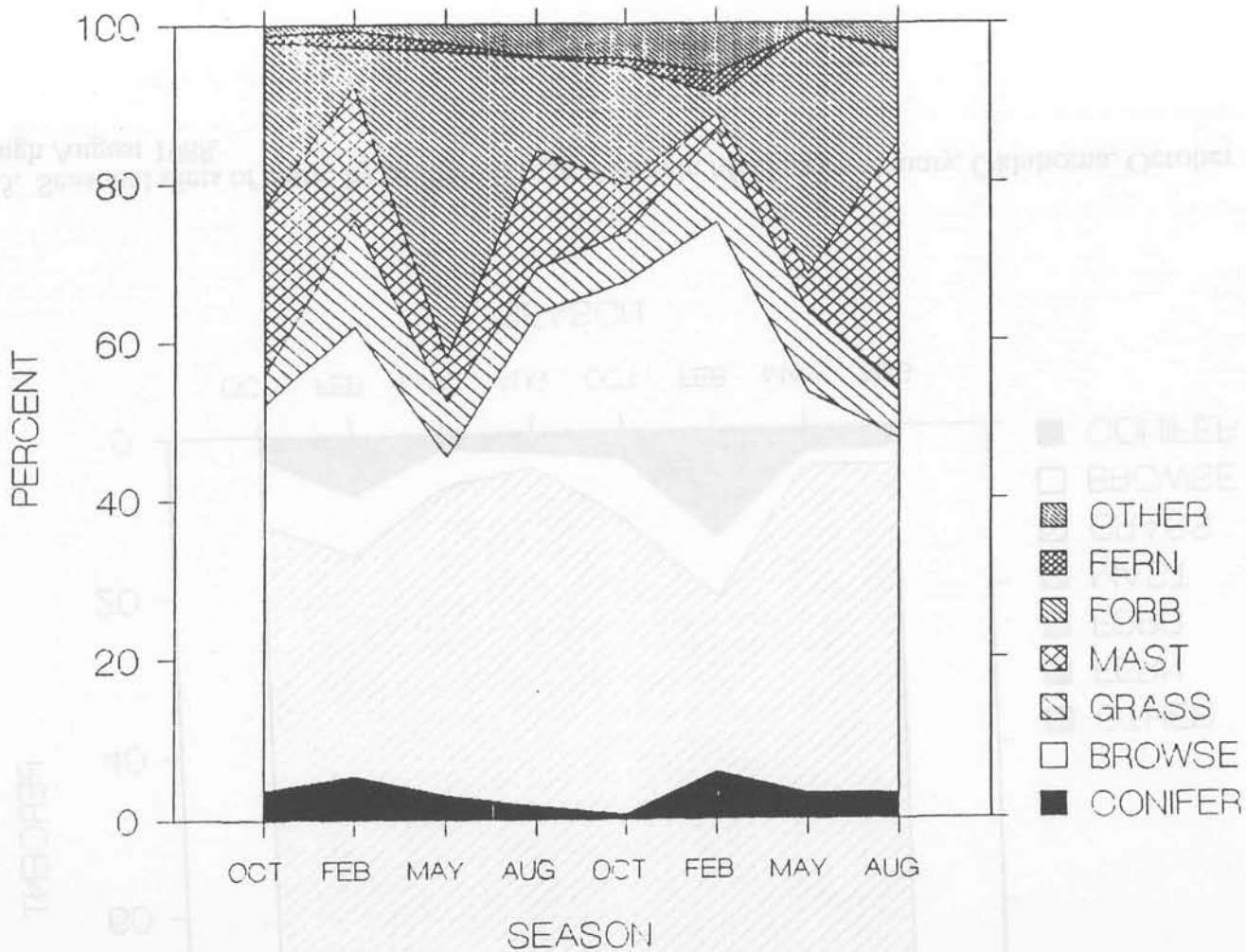

Fig. 4. Seasonal diets of white-tailed deer by primary forage classes in Pike County, Arkansas, October 1986 through August 1988.

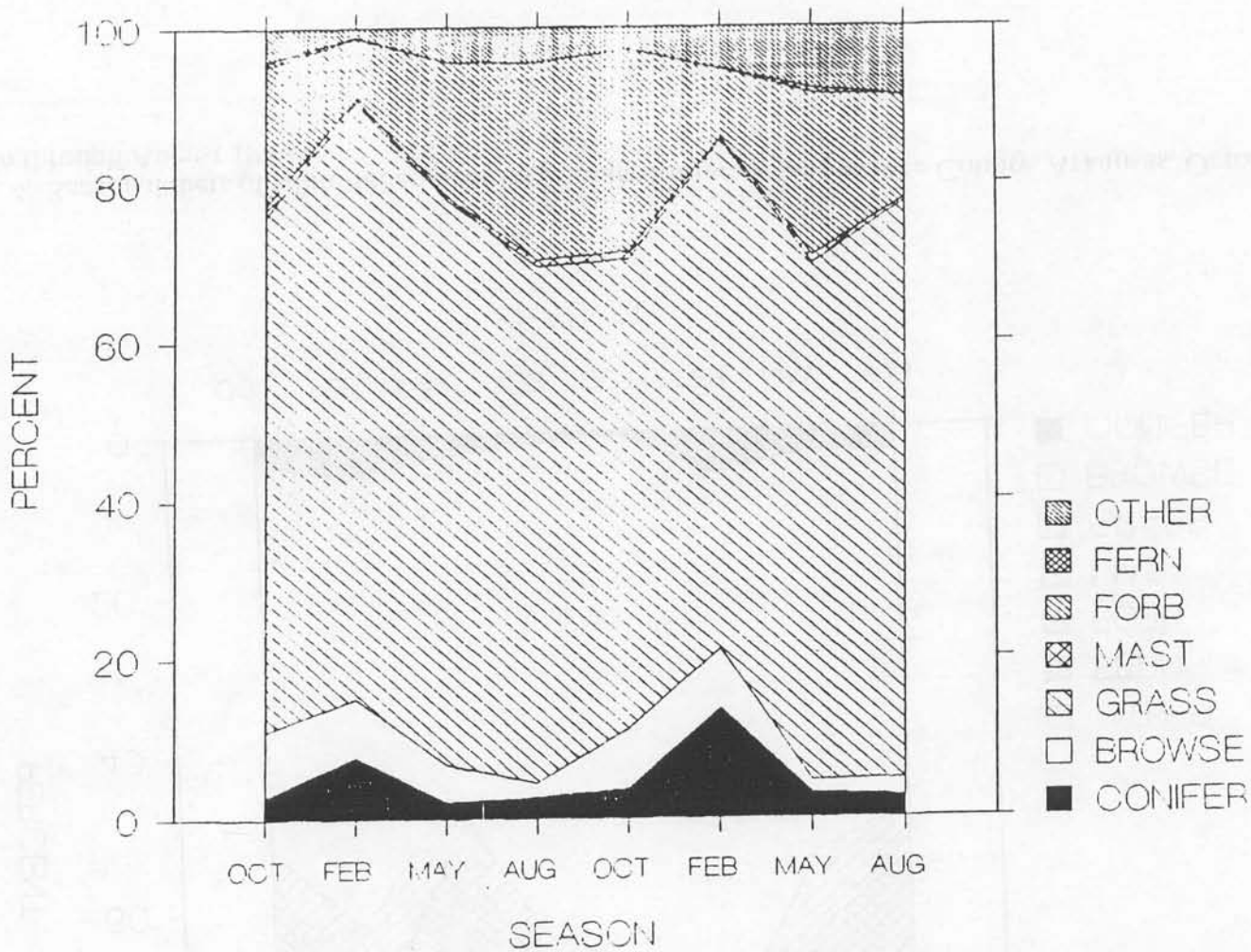

Fig. 5. Seasonal diets of cattle by primary forage classes in McCuratin County, Oklahoma, October 1986 through August 1988.

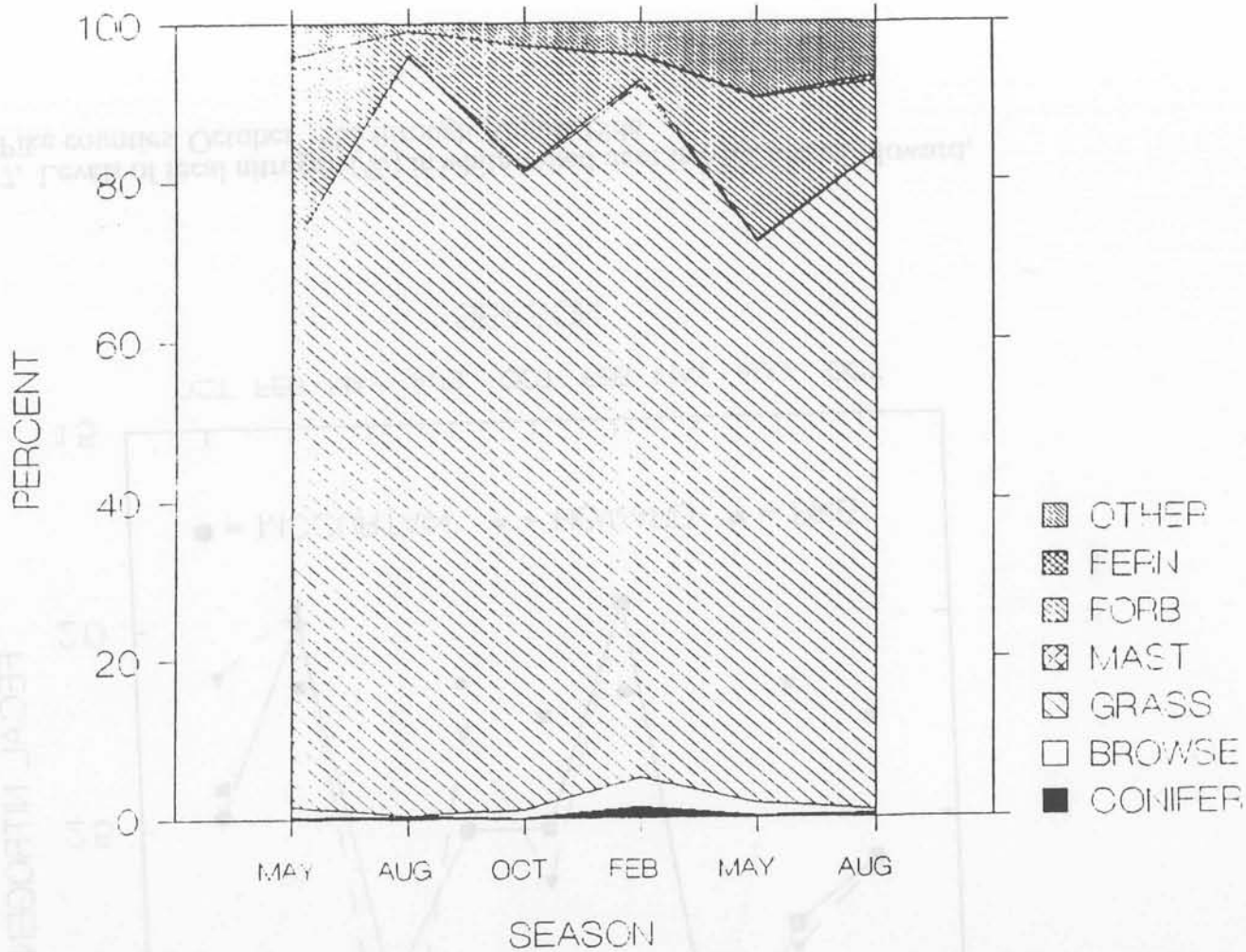

Fig. 6. Seasonal diets of cattle by primary forage classes in Howard County, Arkansas, May 1987 through August 1988.

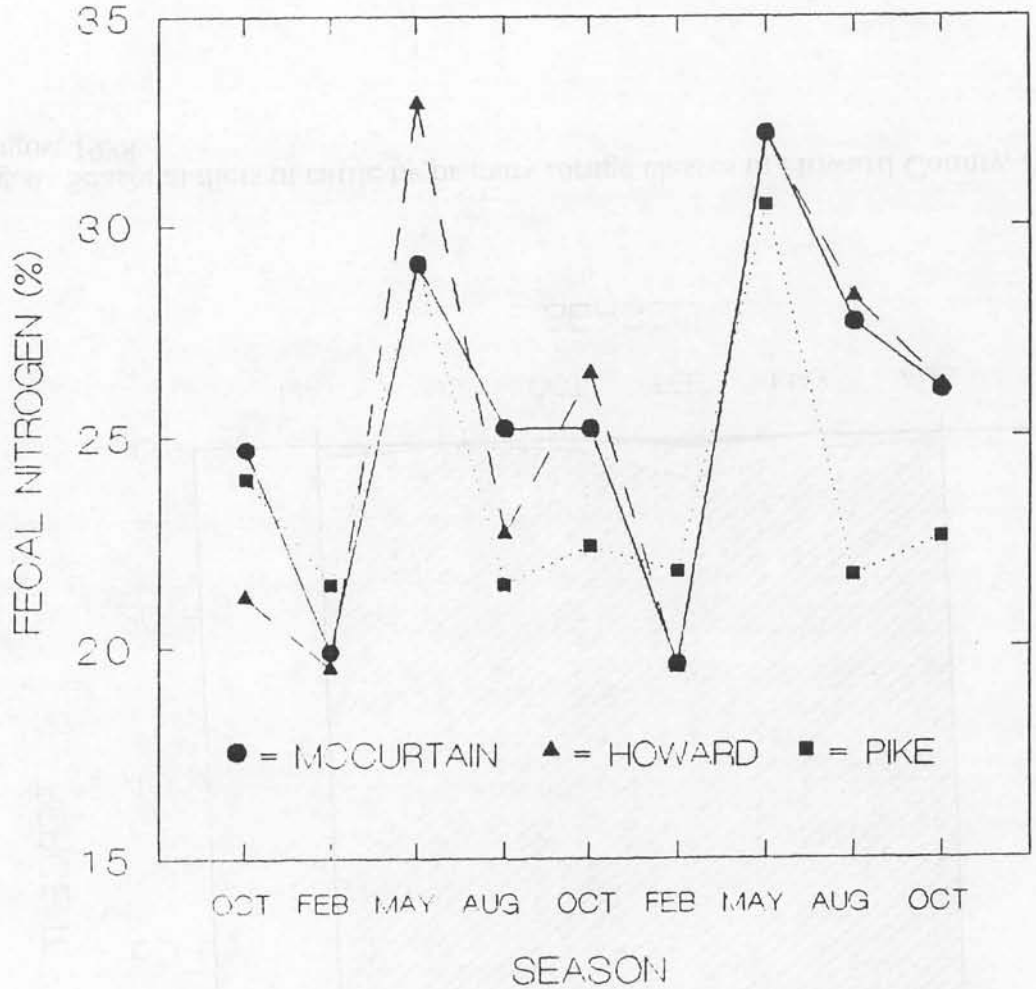

Fig. 7. Levels of fecal nitrogen (%) in white-tailed deer in McCurtain, Howard, and Pike counties, October 1986 through August 1988.

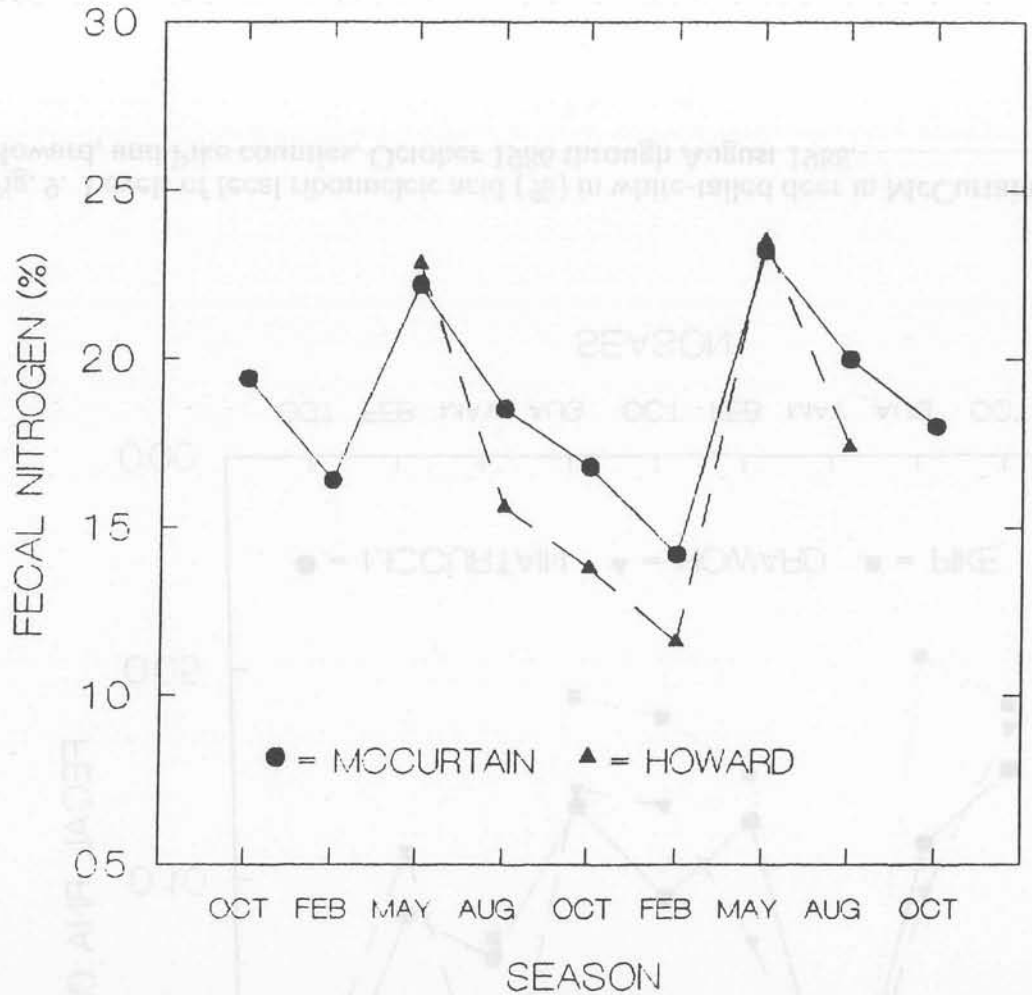

Fig. 8. Levels of fecal nitrogen (%) in cattle in McCurtain and Howard counties, October 1986 through August 1988.

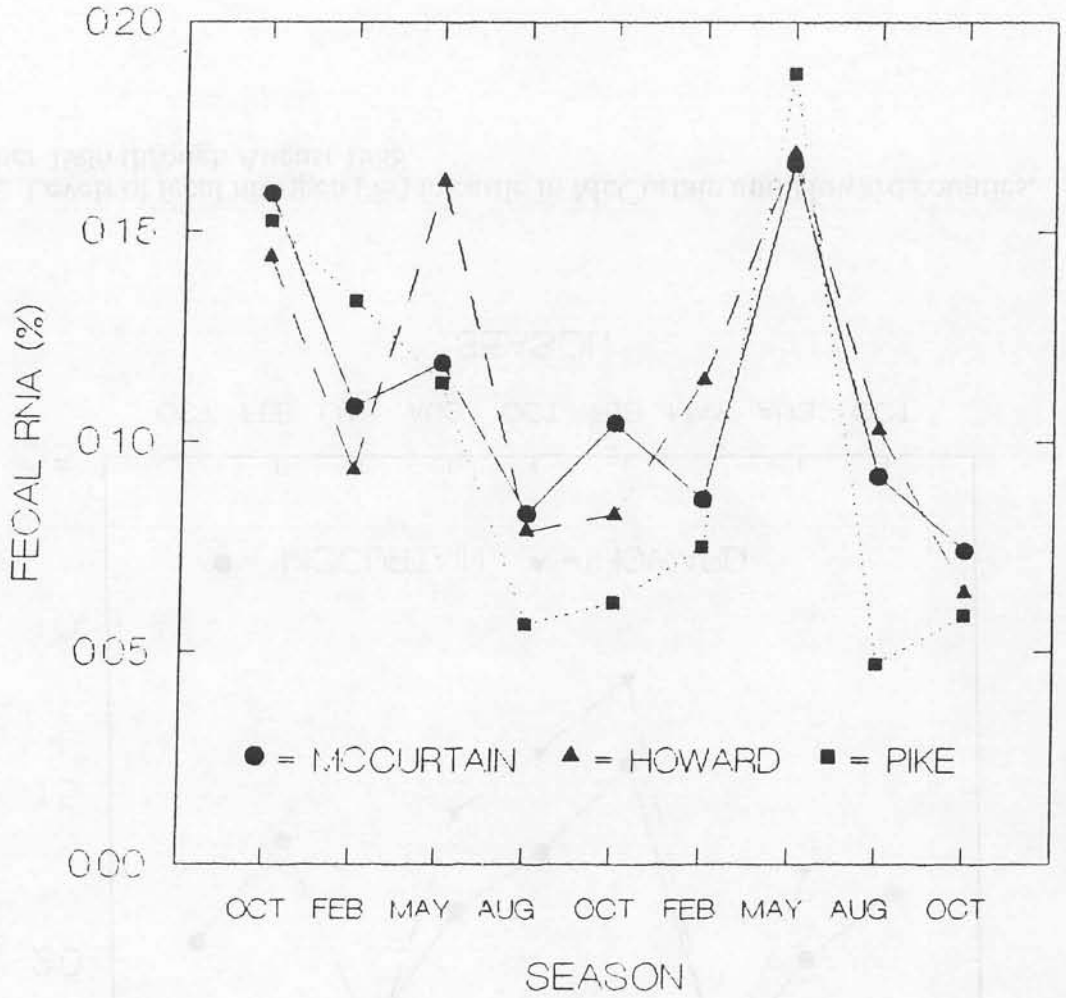

Fig. 9. Levels of fecal ribonucleic acid (%) in white-tailed deer in McCurtain, Howard, and Pike counties, October 1986 through August 1988.

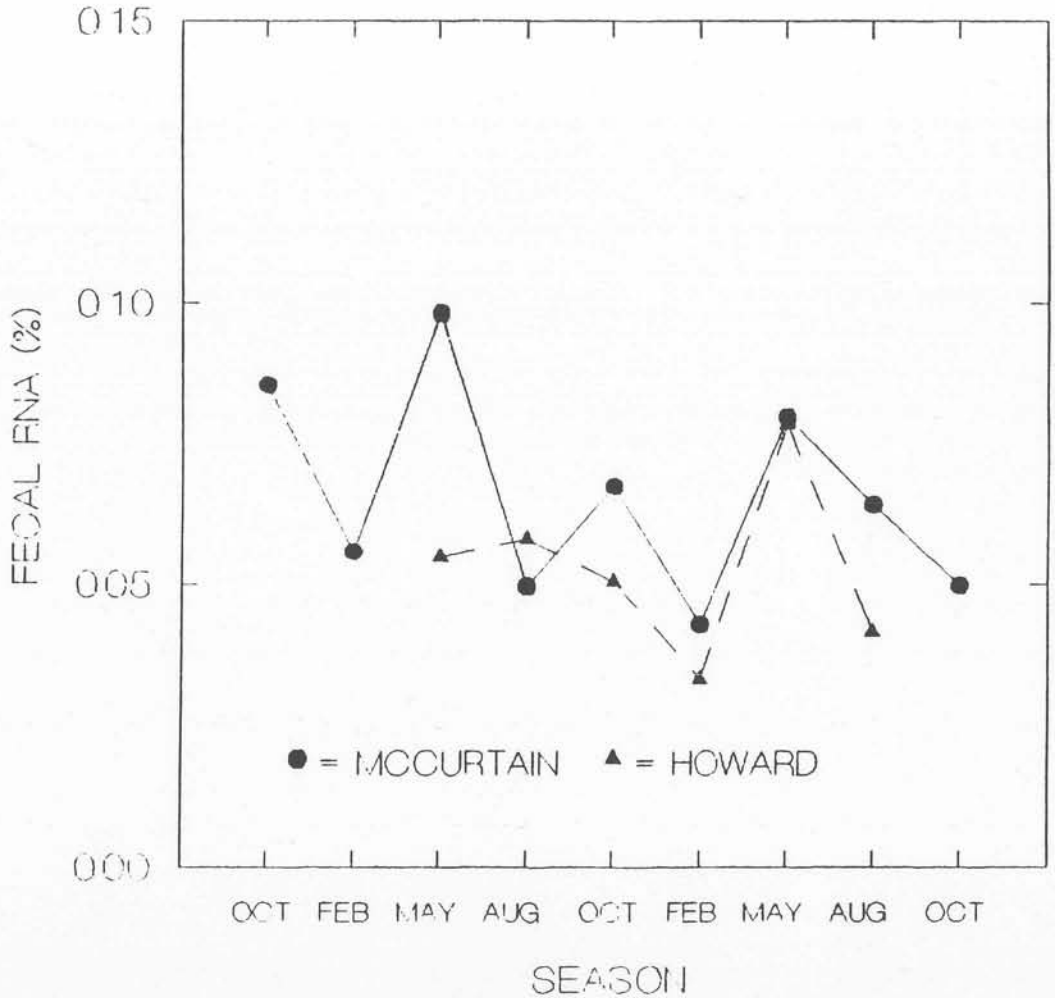

Fig. 10. Levels of fecal ribonucleic acid (%) in cattle in McCurtain and Howard counties, October 1986 through August 1988.

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