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Computer Program for Teaching Forage Management and Utilization: Beef Forage Management System (BFMS)

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COMPUTER PROGRAM FOR TEACHING FORAGE MANAGEMENT AND UTILIZATION

Beef Forage Management System (BFMS) *

by

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I. INTRODUCTION.

The BFMS computer program has been written to help students and farmers plan beef-forage systems by calculating the forage requirements of specified livestock classes when estimating the forage supplied by perennial and annual pastures, and stored feed or grain crop stubbles.

The program is written in PL/1. To run the program, the user must supply the number and type of cattle to be fed, and the acreage, yield potential, and type of forage potentially available. The program uses this information to develop and print three tables. One table presents the amount of forage required to feed the animals specified for each month. Another table lists the forages available to meet those needs for each month and gives the surplus or deficit forage production for each month as well as for the calendar year. The final table is a concise summary of the first two. The program provides for carrying over extra replacement heifers that will calve as two-year olds, for feeding purchased feeder steers or heifers, and for backgrounding steers or heifers. Feed requirements and available forages are calculated for each month in animal-unit months (AUM). An AUM is the amount of feed a 1,000-pound beef cow needs per month to maintain weight.

The program can be used as a tool to calculate the forage needs of cattle when planning year-round forage-feeding systems. The beef-forage producer can estimate forage-production deficiency and surplus periods, and can plan to graze or store the surplus, and produce, buy, or carry-over forages to meet the deficiency periods. The producer who wants to expand a herd or buy feeder calves can use the program to evaluate a decision to purchase more grazing acres, to renovate old fields to increase production, or to rent more land.

II. ANIMAL NEEDS.

From information specified by the user on the number and classes of cattle to be fed for one year and a table of beef cattle needs (Table 1), the program prints the animal input data (Table 2) and generates the Forage Feed Requirements table (Table 3).

The program calculates forage-feed requirements for ten classes of cattle: beef cows, calves, replacement heifer calves, replacement heifer yearlings, steer calves, heifer calves, feeder steers, feeder heifers, backgrounded steers or heifers, and bulls. The use identifies the class by name, as explained in the instructions that follow.

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* Based on a program originally written by O. Buller, R.F. Munyan, and G. Posler, Kansas State University.

** Professor of Plant and Soil Science, University of Tennessee. Thanks are extended to J.B. McLaren, Professor of Animal Science, and J.H. Reynolds, Professor of Plant and Soil Science, University of Tennessee, for their comments and constructive review of the assumptions on animal requirements and forage production.

The needs for a beef cow are divided into four periods:

Period 1, post-calving, up to 90 days after calving, when the cow requires 1.2 AUM/month;

Period 2, lactation, the next 120 or 150 days, when the cow is pregnant, gives less milk than just after calving, requires 1.05 AUM/month, and during which time the calves are weaned at 7 or 8 months of age;

Period 3, mid-gestation, the next 90 or 60 days (depending on weaning age), when the cow is pregnant but not lactating because the calf has been weaned, and requires only 0.7 AUM/month;

Period 4, pre-calving, the 60 days before calving, when the cow requires 1.0 AUM/month.

The number of cows in a herd, with no allowance for increasing or decreasing the size of the cow herd or nutritional needs, is presented on one line of the Animal Forage Feed Requirements table. It is assumed that cows will calve the same month every year and produce the same percentage calf crop. The percentage of cows expected to calve, an input to the program, determines the number of cows that will be culled. The culled cows are automatically replaced by two-year-old heifers. More than one herd of cows may be specified, with different calving dates and different calf crop percentages.

The needs of the calves, presented in the Animal Forage Feed Requirements table (Table 3), begin with the first day of the month in which they were born. To calculate those needs, the user specifies the month in which the calves were born; that identifies the beginning of Period 1 of the cow feed requirements for the cow and initiates calculation of needs for the calves. All calves are assumed to weigh 400 lb at weaning and to gain 1.65 lb/day after weaning. Weaning age can be specified as being either 7 or 8 months of age. The AUM needs of the calves are increased every two months (every 100 lb) until they become one year old.

The needs of the calves not yet weaned are presented on the line of the Animal Forage Feed Requirements table labeled CALVES. Once the calves have been weaned, their needs are presented on different lines, as STEER CALVES, HEIFER CALVES, or REPLACEMENT HEIFER CALVES. These needs show up for the next 4 or 5 months (depending on weaning age), or until the calves are one year old, or fewer months if the producer chooses to sell them before their first birthday. If STEER CALVES or HEIFER CALVES are kept after they are one year old, their needs are labeled as those for STEERS or HEIFERS. When the REPLACEMENT HEIFER CALVES become one year old, they automatically are reclassified as REPLACEMENT HEIFER YEARLINGS.

The number of replacement heifers that calve as two-year-olds must be the same as the number of cows that are culled. Until the replacement heifers are 19 months old, however, a greater number may be kept. To keep extra replacement heifers, the user specifies the extra number to keep, and the forage requirements for that number will be presented as part of the REPLACEMENT HEIFER YEARLINGS. When the extra replacement heifers become 19 months old, their needs are no longer calculated. The REPLACEMENT HEIFER YEARLINGS shown in the Animal Forage Feed Requirements table are from the calf crop of the previous year. However, because it is assumed that herd size does not increase, the number of REPLACEMENT HEIFER YEARLINGS from the previous year will be the same as the number carried over from the current year crop.

Feeder calves weighing from 200 to 900 lb may be purchased at any time during the year and specified as STEERS or HEIFERS, and their forage needs will be presented in the Animal Forage Feed Requirements table as FEEDER STEERS or FEEDER HEIFERS. The user must indicate the month of purchase, the average weight (in 50-lb increments) of calves when purchased, and the month in which they will be sold. The program assumes that the calves will gain 1.65 lb/day and that their forage needs will increase each month as they grow. More than one line of STEERS or HEIFERS may be shown on the Animal Forage Feed Requirements table at the same time. This allows for the situation when two or more groups of steers or heifers are purchased at different times or weights.

Steer or heifer calves to be backgrounded after weaning may also be specified as BACKGROUNDED steers or heifers. The user must indicate the month of purchase, the average weight (in 50-lb increments) at the start of the backgrounding period, and the month in which they will be sold. The program assumes the animals will gain 0.6 lb/day in October through March, 0.84 lb/day in April through July, and that no cattle will be backgrounded in August or September. Since the program works on only one calendar year at a time, numbers of backgrounded cattle may need to be provided for starting in both October and January.

III. FORAGE PRODUCTION.

The user specifies the type of forage produced in each field, the size of the field, and the potential forage productivity for that crop in that field at the proposed level of management (low, medium, or high). Any number of fields may be specified, with up to 32 different crops (Table 4).

The program uses the specified type of forage, size of field, forage productivity, and a table of the total and monthly production estimates for each type of forage specified to formulate the Forage Production table. The Forage Production table lists the monthly AUM production by field, the total AUM monthly production in all fields combined, and the monthly and yearly surpluses and deficits of available forage. The monthly deficit/surplus amounts are totaled, so the user can determine how many AUM's of stored forage are needed to carry the animals for one year (Table 6).

IV. INPUT FORMATS AND REQUIREMENTS.

The JCL cards which follow are appropriate when the program is stored on computer disk on the UTCC mainframe IBM 3031 computer. Following the JCL cards come input data cards describing the farm and/or specific computer run, (TITLE DATA), the animals (HERD DATA), then a card saying END, then the cards describing the forages (FORAGE DATA).

A. To run the program, the following card deck is required:

```
//  a JOB card
//BFMS EXEC PGM=BFMSGO,REGION=256K
//STEPLIB DD DSN=J1031.BFMSGO,DISP=SHR
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
   (TITLE DATA)
   (HERD DATA)
END
   (FORAGE DATA)
```

B. TITLE DATA

Any information, up to 80 columns. A card must be included, even if if the title is to be blank.

C. HERD DATA

Animal classes are described and entered as individual cards with a maximum of 20 total beef classes allowed. Each cow card automatically generates animal feed requirements for six beef classes: cows, calves, steer calves, heifer calves, replacement heifer calves, and replacement heifer yearlings. Feeder and backgrounded steers and heifers, whether raised on the farm or purchased, must be separate inputs.

The class of animal is identified by a label which must begin in column 1 and end before column 11. Only the upper case part of the label is necessary. Numeric data (described below) must begin in or after column 11 but can appear anywhere on the card, separated by blanks and entered in the order listed below. All numeric variables must be entered. Following all HERD DATA, an END card is required.

Input should be in the following format:

1. COWs HERDSIZE MOBORN PCTCALVING AGESOLD X_REPL_HFRS WEANAGE

HERDSIZE An integer describing the number of cows.

MOBORN An integer from 1 to 12 for the calendar month in which calves will be born.

PCTCALVING A real number between 0 and 1.0 giving the percentage of cows that will successfully bring a calf to weaning (e.g., 0.85 denotes an 85% calf crop). Cows that do not wean a calf are culled when the calves are weaned.

AGESOLD An integer between weaning age and 12 giving the age, in months, at which the calves will be sold. Their forage needs will be computed through the end of the month when sold. If they are to be kept longer than one year, the age sold must be 12, and separate inputs must be made for the yearling steers and heifers. In the Animal Feed Requirements table, all calves appear for the months before weaning under the classification CALVES, then are split into STEER CALVES, HEIFER CALVES, and REPLACEMENT HEIFER CALVES after weaning.

X_REPL_HFRS An integer specifying the number of heifer calves kept as replacement heifers from prior generation in addition to the number needed to exactly replace cows culled. At the end of the month when the calves are weaned and the cows culled, this extra number of yearling replacement heifers also will be sold. For example, a cow herd of 100 with an 80% calf crop will require 20 replacement heifers to maintain herd size. If the producer wishes to keep 10 more heifers than the automatic replacement number of 20, X_REPL_HFRS should be equal to 10. If no extra replacement heifers are kept, this value must be put in as a zero.

WEANAGE An integer specifying the weaning age for calves; it must be 7 or 8.

2. BULls HERDSIZE WEIGHT

HERDSIZE An integer describing the number of bulls.

WEIGHT An integer between 1000 and 3000, in increments of 500, describing the average weight of the bulls in pounds.

3. STEers HERDSIZE WEIGHT MOSTART MOSOLD

HERDSIZE An integer describing the number of yearling feeder steers.

WEIGHT An integer between 200 and 900, in increments of 50, giving the average weight of the steers, in pounds, in the month when they are placed on feed.

MOSTART An integer between 1 and 12 indicating the calendar month in which steer needs will begin. For purchased steers, that will be the month when purchased. For yearling feeder steers kept from last year's calf crop, the required input will be the month in which the steers become one year old.

MOSOLD An integer between 1 and 12 giving the calendar month in which the steers are sold. Steers are assumed to be kept until the last day of the month when sold.

4. HEIfers HERDSIZE WEIGHT MOSTART MOSOLD

All inputs for yearling feeder heifers are the same as described for feeder steers above. They are included separately because their feed requirements differ from those of steers. Note that yearling feeder heifers cannot be used as replacement heifers.

5. FALlback or SPRingback HERDSIZE WEIGHT MOSTART MOSOLD

All inputs for BACKGROUNDED steers or heifers are as described for feeder steers above. Fall-backgrounded cattle start between October and December, and spring-backgrounded cattle between January and June. Note that the MOSTART age will be an integer from 1 to 12 which will describe calves to be backgrounded between October and June. There may need to be two herds, one starting in the fall and another in the spring (January), since the program considers only one calendar year at a time. No backgrounding may take place in August or September. Initial weight is used only to check whether it is in the acceptable range of between 200 and 900 pounds.

D. FORAGE DATA

An unlimited number of forages may be included, with each type or field on a separate card. Each card must contain three integers in the order described below, and they may appear anywhere on the card, separated by blanks.

1. FORAGETYPE PRODUCTIVITY ACRES

FORAGETYPE An integer corresponding to one of the 32 possible codes shown in Table 4.

PRODUCTIVITY An integer between 1 and 3 giving the producer's estimate of the productivity for each field (1=low; 2=medium; 3=high).

ACRES An integer describing the field size in acres.

E. SAMPLE INPUT

The example is for a 100-cow herd with a calving percentage of 0.90; the calves, born in February, are to be sold when 14 months old. Twenty heifer calves are to be kept -- 10 as replacements for cows culled. The calves are to be weaned at 8 months of age. In addition, 30 feeder steers weighing 450 lb are to be purchased in March and sold in July, and 15 feeder heifers weighing 550 lb are to be purchased in April and sold in September. Three bulls with an average weight of 1500 lb are included. Twenty steers weighing 600 lb are to be backgrounded starting in January and will be sold in July (Table 2).

Twelve types of forages are to be used to feed livestock: 25 acres of unimproved A. virginicus of low productivity; 30 acres of tall fescue + 20% clover of medium productivity; 20 acres of stockpiled tall fescue of medium productivity; 27 acres of newly-renovated tall fescue of medium productivity; 25 acres of orchardgrass + clover of medium productivity; 15 acres of orchardgrass + clover of high productivity; 17 acres of annual lespedeza of low productivity; 16 acres of small grains pasture of medium productivity; 62 acres of grass-legume hay of medium productivity; 8 acres of sorghum-sudangrass hybrid of high productivity; 57 acres of corn stalks from a high productivity field; and 20 acres of corn silage cut from a field of high productivity (Table 5).

The following deck was used to generate the sample run:

```
//BFMSGO JOB
//BFMS EXEC PGM=BFMSGO,REGION=256K
//STEPLIB DD DSN=J1031.BFMSGO,DISP=SHR
//SYSPRINT DD SYSOUT=A
//SYSIN DD *
SAMPLE RUN FOR BFMS, INPUT OF JUNE 16, 1983
COW        100  2    0.90 14   10  8
BULL       3    1500
STEERS     30   450  3    7
HEIFER     15   550  4    9
SPRINGBCK  20   600  1    7
END
1    1    25
4    2    30
7    2    20
8    2    27
10   2    25
10   3    15
13   1    17
22   2    16
32   2    62
24   3     8
27   3    57
29   3    20
```

Table 1. Beef animal requirements. *

Cattle	Period	Weaning age 7 mo.	Weaning age 8 mo.	Weight(lb)	ADG(lb)	AUM/mo.
COWS	Post-calving	90	90			1.2
	Lactating and pregnant	120	150			1.05
	Mid-gestation	90	60			0.7
	Pre-calving	60	60			1.0
CALVES	Cows in post-calving				1.60	0.1
	Cows lactating and pregnant				1.60	0.3
STEERS AND HEIFERS				200	1.65	0.3
				250	1.65	0.375
				300	1.65	0.45
				350	1.65	0.55
				400	1.65	0.65
				450	1.65	0.725
				500	1.65	0.8
				550	1.65	0.875
				650	1.65	0.95
				650	1.65	1.025
				700	1.65	1.1
				750	1.65	1.15
				800	1.65	1.2
				850	1.65	1.25
				900	1.65	1.3
STEER AND HEIFER CALVES				400	1.65	0.65
				500	1.65	0.8
				600	1.65	0.95
REPLACEMENT HEIFER CALVES				400	1.65	0.7
				500	1.65	0.85
				600	1.65	1.0
REPLACEMENT HEIFER YEARLINGS				650	1.65	1.0
				700 plus	1.65	1.1
BULLS				1000		1.0
				1500		1.37
				2000		1.75
				2500		2.12
				3000		2.5
BACKGROUNDED CALVES	Jan thru Mar				0.75	0.6
	Apr thru Jul				1.65	0.84
	Aug thru Sep				0	0
	Oct thru Dec				0.75	0.6

* *The amount of TDN or ENE per animal unit month (AUM) has been reported in a range of 270-480 lb TDN/AUM; the information in the table assumes 320 lb TDN/AUM. A 1000-lb beef cow equals 12 AUM's.*

Table 2. SAMPLE RUN FOR BFMS, INPUT OF JUNE 16, 1983

ANIMAL CLASS	NUMBER	MONTH BORN	% CALVING	AGE SOLD	EXTRA HEIFERS	WEANAGE	WEIGHT-LB	MONTH START	MONTH END
COW	100	2	0.90	14	10	8			
BULL	3						1500		
STEERS	30						450	3	7
HEIFER	15						550	4	9
SPRINGBCK	20						600	1	7

Table 3.

ANIMAL FORAGE FEED REQUIREMENTS (IN AUMS)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
100	COWS*	90.00	120.00	120.00	120.00	105.00	105.00	105.00	105.00	105.00	63.00	63.00	90.00
90	CALVES	0.00	9.00	9.00	9.00	27.00	27.00	27.00	27.00	27.00	0.00	0.00	0.00
45	STEER CALVES	42.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.25	36.00	36.00
25	HEIFER CALVES	23.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.25	20.00	20.00
20	REP HF CALVES	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.00	17.00	17.00
20	REP HF YRLGS	11.00	20.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	11.00	11.00	11.00
3	BULLS	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11	4.11
30	FEEDER STEERS	0.00	0.00	21.75	21.75	21.75	21.75	21.75	0.00	0.00	0.00	0.00	0.00
15	FEEDER HEIFERS	0.00	0.00	0.00	13.12	13.12	13.12	13.12	13.12	13.12	0.00	0.00	0.00
20	SPRING-BACKGRD	12.00	12.00	12.00	16.80	16.80	16.80	16.80	0.00	0.00	0.00	0.00	0.00
	ANIMAL NEED	203.61	165.11	188.86	206.78	209.78	209.78	209.78	171.23	171.23	137.61	151.11	178.11
	YEAR TOTAL	2202.99											

* CALVES ARE WEANED AT 8 MONTHS. COWS AND REPLACEMENT HEIFERS ARE ALSO CULLED AT THIS TIME.

Table 4. Tennessee forage resources for grazing.

Code	Forage resource	Percent of yearly total production												Animal unit days per acre *		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Product. level: low	med	high
1	Unimproved pasture (Andropogon virginicus)			14	20	25	8	6	3	8	10	6		80	100	100
2	Tall fescue - no N or clover		2	12	25	21	8	4	4	8	10	4	2	105	140	160
3	Tall fescue + 100 N/yr	2	6	14	20	15	6	2	3	7	15	8	2	130	172	210
4	Tall fescue + 10-20% clover	2	3	10	25	20	8	4	4	8	10	4	2	160	206	250
5	Tall fescue + 200 N/yr	2	6	14	20	15	6	2	3	7	15	8	2	180	241	300
6	Tall fescue + 20-50% clover	2	4	13	27	22	8	4	4	8	11	5	2	175	218	260
7	Tall fescue, stockpiled	10	6	14	20	15	6	2				10	10	180	241	300
8	Tall fescue, first year after renovation				15	35	12	8	4	8	11	5	2	130	160	204
9	Orchardgrass, no N		1	15	35	25	15			2	4	2	1	100	130	155
10	Orchardgrass + clover	1	2	12	25	20	10	6	6	7	8	2	1	165	206	250
11	Orchardgrass + 200 N/yr	2	5	14	20	19	8	4	5	7	10	4	2	165	216	270
12	Kentucky bluegrass + clover		1	10	15	25	20	10	4	6	7	2		125	131	135
13	Annual lespedeza					3	12	35	30	18	2			125	131	137
14	Sericea lespedeza				5	15	30	25	15	10				132	138	143
15	Unimproved bermudagrass				6	11	16	27	21	15	3	1		90	110	110
16	Bermudagrass + 100 N/yr				8	10	15	25	20	15	5	2		135	172	206
17	Bermudagrass + 200 N/yr				8	10	15	25	20	15	5	2		232	309	386
18	Bermudagrass + 400 N/yr				8	10	15	25	20	15	5	2		295	425	531
19	Bermudagrass + clover			3	10	12	18	20	17	10	8	2	1	240	309	370
20	Bermudagrass + tall fescue + clover	2	1	4	12	18	15	14	11	8	9	4	2	250	360	450
21	Annual ryegrass + 150 N/yr	5	7	13	18	24	20	3			3	4	3	180	225	280
22	Small grains + 100 N/yr	4	10	12	27	28	3				6	7	3	120	150	190
23	Pearlmillet + 150 N/yr					7	20	30	25	15	3			192	275	330
24	Sorghum-sudangrass + 150 N/yr					7	20	30	25	15	3			216	309	370
25	Alfalfa, grazed				25	20	15	10	15	10	3	2		220	300	380
26	Red clover-grass pasture	1	2	10	25	20	12	6	6	7	8	2	1	175	225	270
27	Corn stalks									20	30	30	20	28	38	48
28	Sorghum stubble									10	40	30	20	20	31	39
29	Corn silage	20	20	20								20	20	310	447	580
30	Soybean stubble										10	50	40	18	25	30
31	Grass hay	25	30	5						2	4	14	20	180	240	300
32	Grass-legume hay	25	30	5						2	4	14	20	195	260	325

* 30.5 animal unit days = 1 AUM.

Table 5. SAMPLE RUN FOR BFMS, INPUT OF JUNE 16, 1983

FORAGE PRODUCTION (IN AUMS)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
UNIMP PAST A.VIRGIN. LOW PRODUCTIVITY 25 ACRES	0.00	0.00	9.20	13.14	16.43	5.26	3.94	1.97	5.26	6.57	3.94	0.00
FESCUE + 10-20% CLO MEDIUM PRODUCTIVITY 30 ACRES	4.06	6.09	20.30	50.76	40.61	16.24	8.12	8.12	16.24	20.30	8.12	4.06
FESCUE + STOCKPILED MEDIUM PRODUCTIVITY 20 ACRES	15.84	9.50	22.17	31.67	23.75	9.50	3.17	0.00	0.00	0.00	15.84	15.84
FESCUE AFTER RENOV. MEDIUM PRODUCTIVITY 27 ACRES	0.00	0.00	0.00	21.29	49.68	17.03	11.35	5.68	11.35	15.61	7.10	2.84
ORCHARDGRASS-CLOVER MEDIUM PRODUCTIVITY 25 ACRES	1.69	3.38	20.30	42.30	33.84	16.92	10.15	10.15	11.84	13.54	3.38	1.69
ORCHARDGRASS-CLOVER HIGH PRODUCTIVITY 15 ACRES	1.23	2.46	14.78	30.80	24.64	12.32	7.39	7.39	8.62	9.86	2.46	1.23
ANNUAL LESPEDEZA LOW PRODUCTIVITY 17 ACRES	0.00	0.00	0.00	0.00	2.09	8.38	24.43	20.94	12.57	1.40	0.00	0.00
SMALL GRAINS + 100 N MEDIUM PRODUCTIVITY 16 ACRES	3.15	7.89	9.46	21.29	22.08	2.37	0.00	0.00	0.00	4.73	5.52	2.37
GRASS-LEGUME HAY MEDIUM PRODUCTIVITY 62 ACRES	132.40	158.88	26.48	0.00	0.00	0.00	0.00	0.00	10.59	21.18	74.14	105.92
SORGHUM-SUDAN +150 N HIGH PRODUCTIVITY 8 ACRES	0.00	0.00	0.00	0.00	6.81	19.45	29.17	24.31	14.59	2.92	0.00	0.00
CORN STALKS HIGH PRODUCTIVITY 57 ACRES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.98	26.96	26.96	17.98
CORN SILAGE HIGH PRODUCTIVITY 20 ACRES	76.22	76.22	76.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.22	76.22

Table 6. SUMMARY

SAMPLE RUN FOR BFMS, INPUT OF JUNE 16, 1983

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
AVAILABLE FORAGE	234.58	264.41	198.89	211.21	219.87	107.42	97.71	78.55	109.00	123.03	223.65	228.11
FROM A TOTAL OF 322 ACRES												
ANIMAL NEED	203.61	165.11	188.86	206.78	209.78	209.78	209.78	171.23	171.23	137.61	151.11	178.11
DEFICIT/SURPL	30.97	99.30	10.03	4.43	10.09	-102.36	-112.07	-92.68	-62.23	-14.58	72.54	50.00

***** THERE IS A TOTAL SURPLUS OF : 277.36 AUM IN SOME MONTHS. BEFORE RE-RUNNING THE PROGRAM,
YOU SHOULD SEE BELOW IF THERE IS ALSO A DEFICIT IN SOME MONTHS WHICH COULD BE STORED, OR CONSIDER:
1. REDUCING THE ACRES OF FORAGE,
OR 2. INCREASING THE ANIMAL NUMBERS,
OR 3. REDUCING THE FORAGE PRODUCTIVITY LEVELS,
OR 4. CHANGING FORAGE TYPES AVAILABLE,
OR 5. MAKE NO CHANGES AND PLAN TO SELL OR USE THE SURPLUS FORAGES.

***** THERE IS A TOTAL DEFICIT OF : - 383.92 AUM IN SOME MONTHS. BEFORE RE-RUNNING THE PROGRAM,
YOU SHOULD SEE IF YOU CAN USE SOME SURPLUS FROM OTHER MONTHS, OR CONSIDER:
1. INCREASING THE ACRES OF FORAGE,
OR 2. DECREASING THE ANIMAL NUMBERS,
OR 3. INCREASING THE FORAGE PRODUCTIVITY LEVELS,
OR 4. CHANGING THE FORAGE TYPES,
OR 5. NOT CHANGE THE INPUTS TO THE PROGRAM, BUT PLAN TO PURCHASE EXTRA FEED FOR THE YEAR.

***** THE NET DEFICIT FOR THE WHOLE YEAR IS: -106.56 AUM.

*** CAUTION *** THE RESULTS OBTAINED FROM THIS PROGRAM CANNOT SUPPLY SPECIFIC QUANTITATIVE ANSWERS TO FORAGE AND ANIMAL MANAGEMENT PROBLEMS. THEY SHOULD BE USED AS A GUIDE TO BETTER UNDERSTANDING OF FORAGE-ANIMAL SYSTEMS. THE RESULTS ARE BASED ON ESTIMATES OF ANIMAL NEEDS AND FORAGE PRODUCTION, AS STATED IN THE MANUAL WHICH ACCOMPANIES THE PROGRAM. THE PROGRAM DOES NOT TAKE CHANGES IN FORAGE QUALITY, AND IN FORAGE AND ANIMAL MANAGEMENT INTO ACCOUNT.

NOTE: THE BEEF-FORAGE MANAGEMENT SYSTEM (BFMS) PROGRAM
WAS DEVELOPED BY G. L. POSLER AND O. H. BULLER, AT KANSAS STATE UNIVERSITY, MANHATTAN KS., AS FMUP1,
MODIFIED BY J. T. GREEN, JR. AT NORTH CAROLINA STATE UNIVERSITY, AND FURTHER MODIFIED AT THE
UNIVERSITY OF TENNESSEE BY H. A. FRIBOURG, WITH J. H. REYNOLDS, J. B. MCLAREN, AND J. B. BURNS,
FOR APPLICATION TO TENNESSEE CONDITIONS.