

Figure 1. Forage mass (lb/acre) produced by system, by month

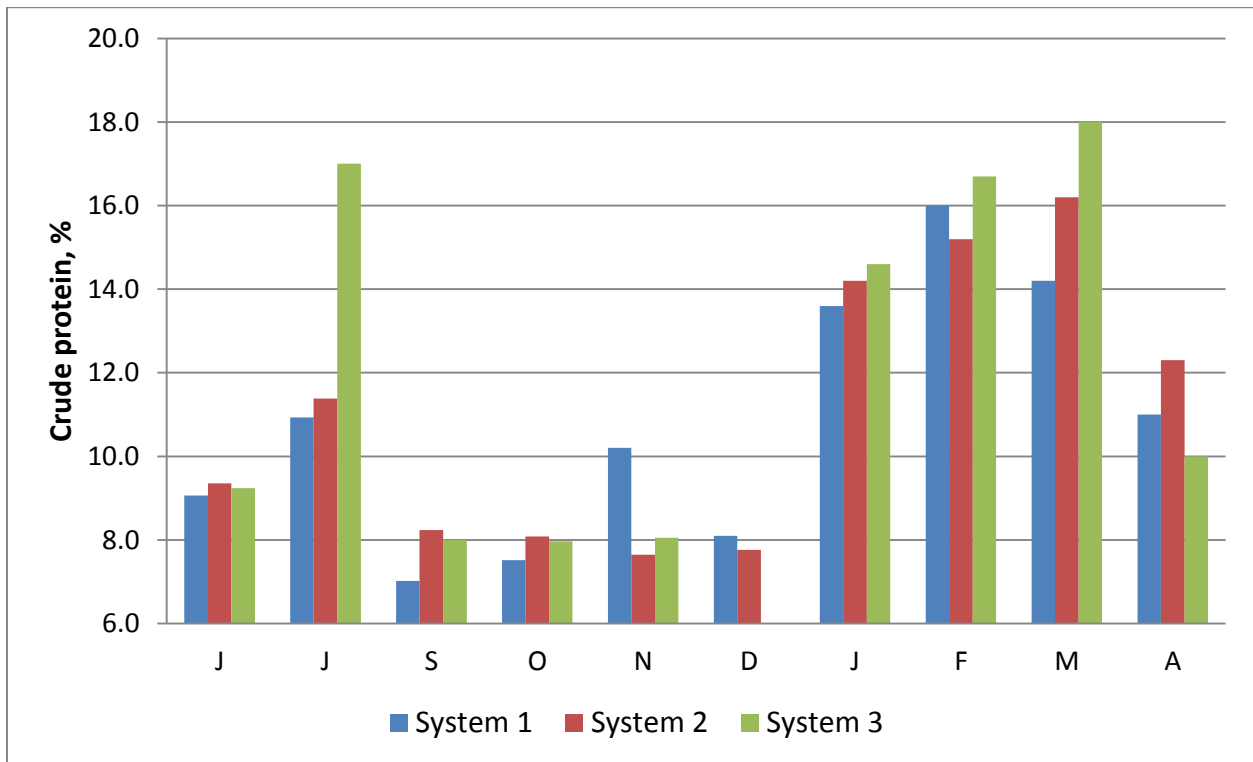


Figure 2. Crude protein concentration in pastures by system, by month

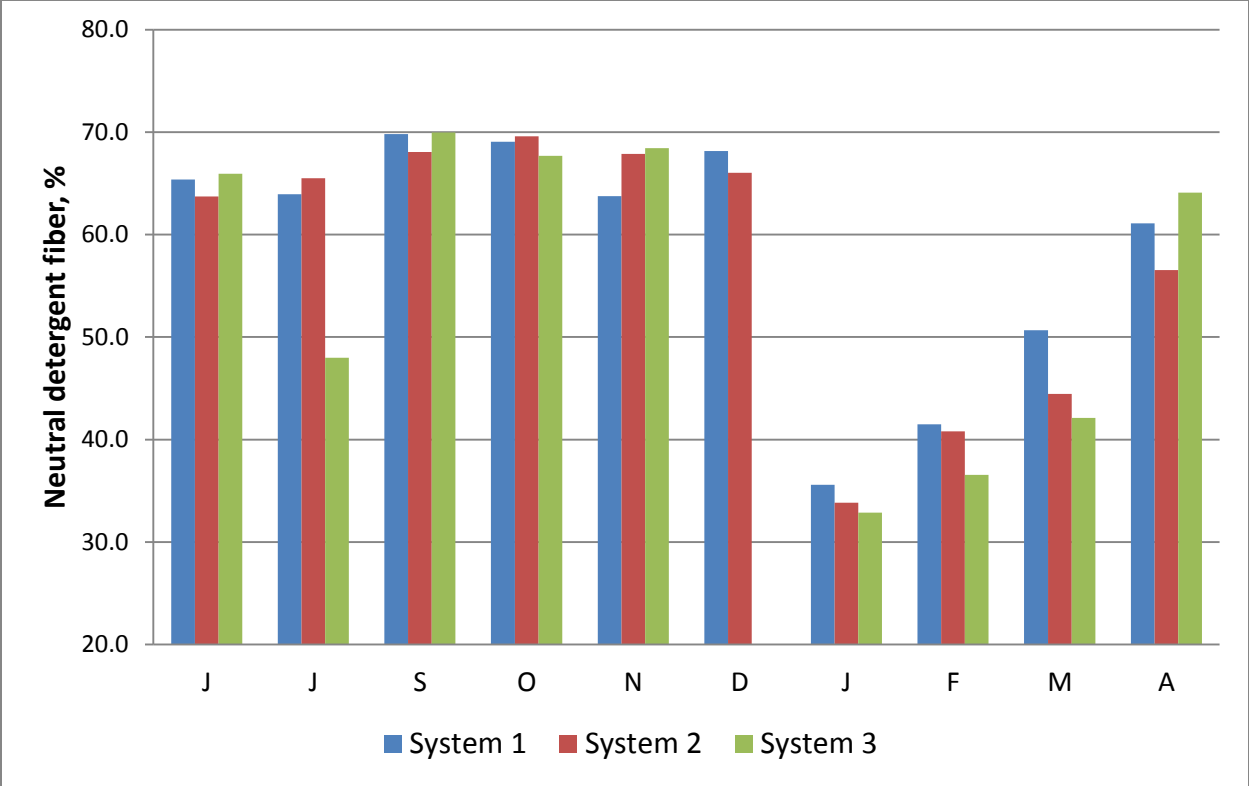


Figure3. Neutral detergent fiber concentration in pastures by system, by month

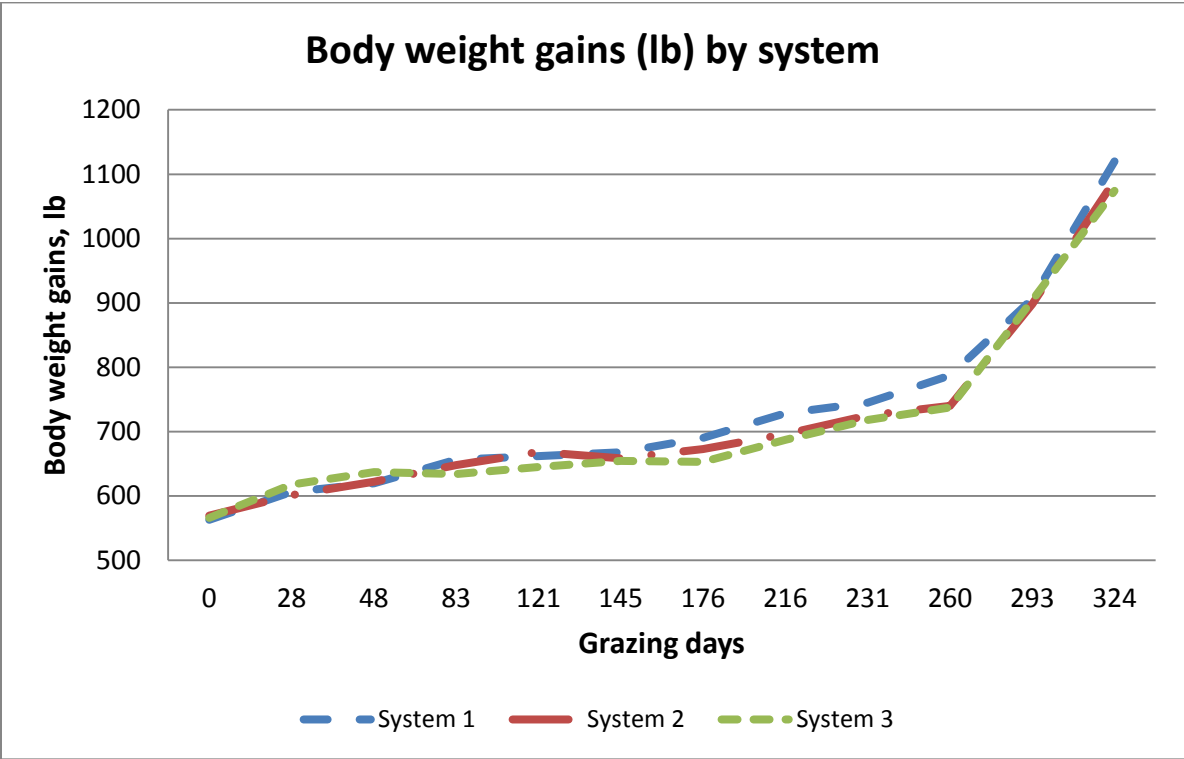


Figure 4. Body weight gains (lb) by system

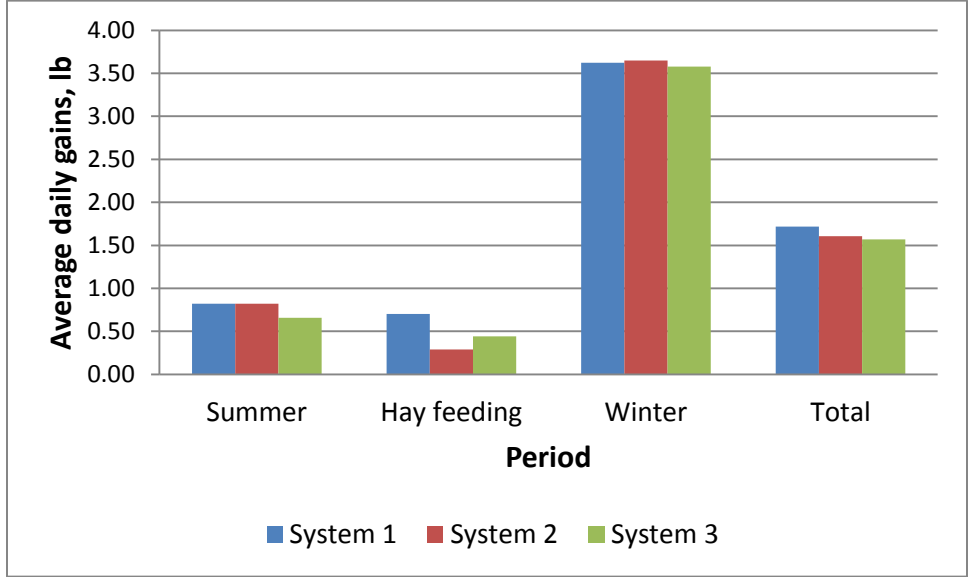


Figure 5. Average daily gains (lb) by period

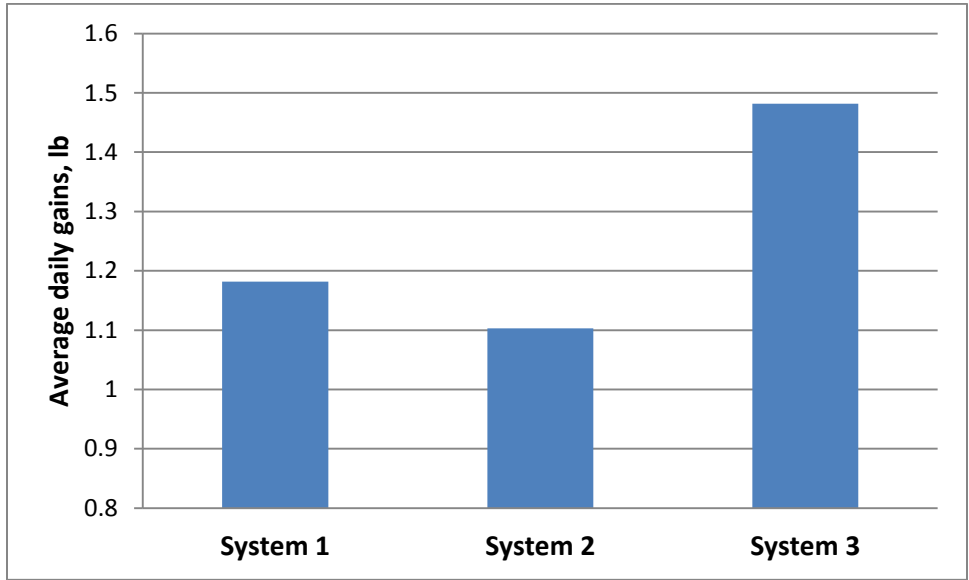


Figure 6. Average daily gains (lb) by system while System 3 steers were on sorghum-sudan

Table 1. Carcass characteristics of steers produced from different systems

	BW, lb	HCW, lb	DP, %	REA, sq.in.	Marbling	KPH, %	PYG	WB, lb
SYSTEM 1	1110	570	51.3	10.2	225	1.5	2.1	6.3
SYSTEM 2	1138	605	53.1	10.0	238	1.7	2.6	6.8
SYSTEM 3	1104	590	53.4	10.3	207	1.8	2.2	6.4
	BW = weight at harvest			REA= Ribeye area, square inches				
	HCW = Hot carcass weight			Marbling = 100-199: P. devoid; 200-299: Traces				
	DP = Dressing percent			KPH = Kidney, pelvic, and heart fat				
				PYG = Preliminary yield grade				
	WB = Warner-Bratzler tenderness; below 8 lb is tender							

Table 2. Average soil characteristics for the forage systems used for the project.

Field	Soil texture	pH	C %	N %	P mg/kg	S mg/kg	K mg/kg	Ca mg/kg	Mg mg/kg
System 3: Ryegrass+Clover	Silty Clay Loam	5.83	1.974	0.1727	30.4	5.7	161.2	3232.9	632.7
System 1: Ryegrass	Silty Clay Loam	5.81	2.042	0.1661	17.0	5.8	137.1	2990.5	598.7
System 2: Ryegrass+Clover	Silt Loam Silty Clay	6.06	1.369	0.1253	14.1	5.6	123.5	2782.1	428.4
System 2: Dalligrass+Clover	Loam Silty Clay	6.32	3.412	0.2797	235.1	11.7	497.4	3606.6	674.6
System 3: Dallisgrass+Clover	Silty Clay Loam	6.01	2.889	0.2605	180.6	10.5	224.8	3826.3	697.6
System 3: Bermudagrass	Silty Clay Loam	6.36	2.806	0.2553	62.6	17.3	181.6	4207.2	699.4
System 2: Bermudagrass	Silty Clay Silty Clay	5.09	2.453	0.2537	19.6	9.9	138.2	3199.9	782.5
System 1: Bermudagrass	Silty Clay Loam	5.31	3.013	0.2591	21.6	10.7	121.0	2814.1	819.3
System 3: Sorghum- sudan+Ryegrass	Silty Clay Loam	5.58	3.288	0.2721	66.8	9.2	254.4	3438.2	747.4
System 3: Soybean+Ryegrass	Silty Clay Loam	5.39	3.205	0.2609	15.8	8.9	160.0	3322.5	791.3

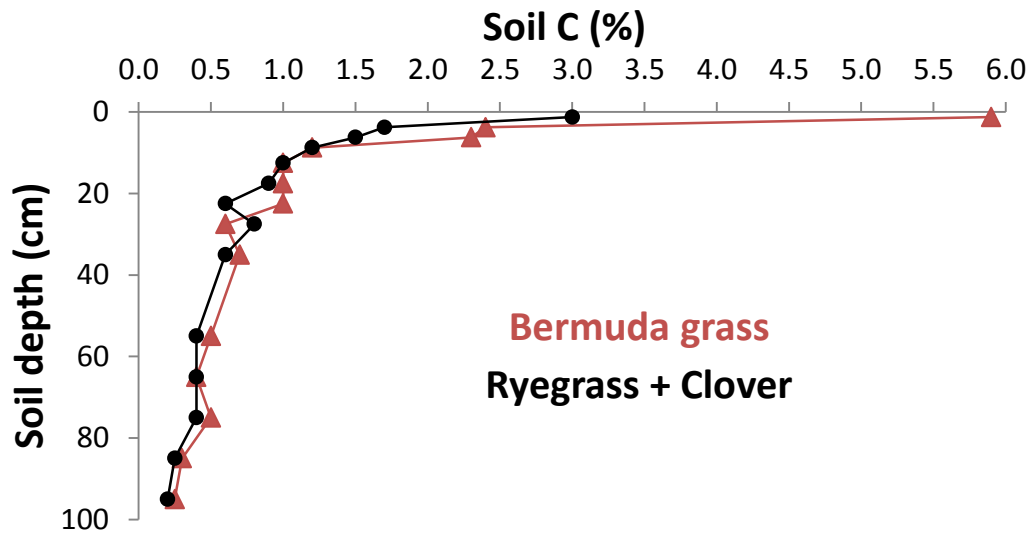


Figure 7. Soil carbon distribution in pasture soil systems

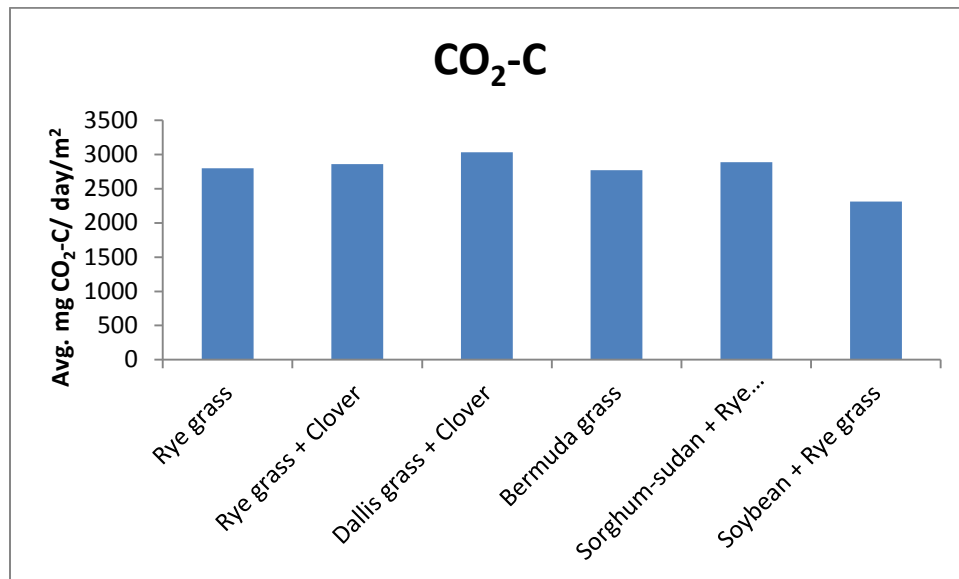


Figure 8. Average rate of CO₂-C emissions from different forage crop systems over 3 year monitoring.

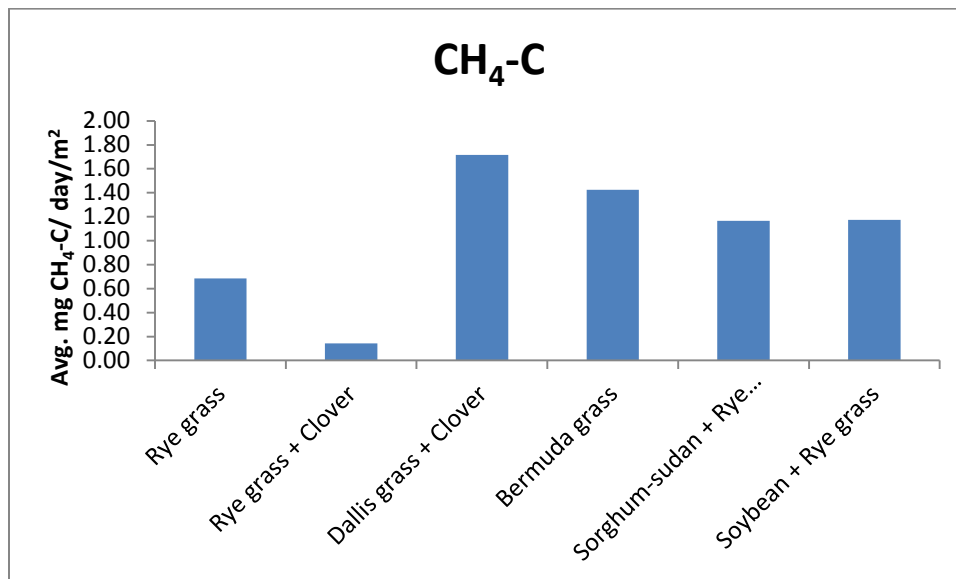


Figure 9. Average rate of CH₄-C emissions from different forage crop systems over 3 year monitoring.

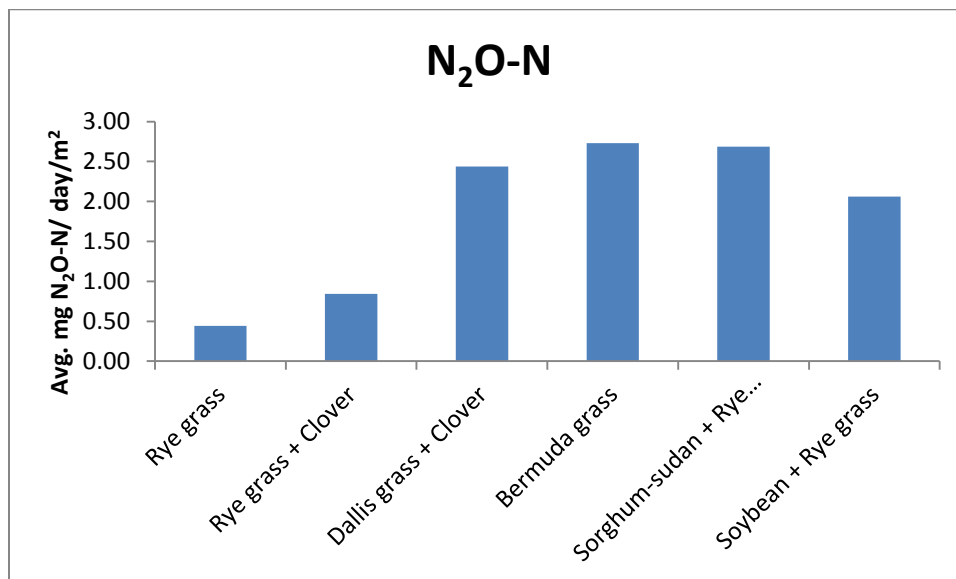


Figure 10. Average rate of N₂O-N emissions from different forage crop systems over 3 year monitoring.

Table 3. Revenue, Expenses and Profit per Treatment (Dollars per Animal)

Item	System 1	System 2	System 3
Steer income	1327.83	1333.67	1315.06
Hay income	833.24 ^{bc}	669.81 ^{ac}	474.35 ^{ab}
Total income	2161.07 ^{bc}	2003.48 ^{ca}	1789.41 ^{ab}
Fertilizer cost	238.37 ^{bc}	173.5 ^a	157.8 ^a
Pesticide cost	48.72	45.80	56.69
Livestock cost	610.72	612.91	613.35
Other cost	8.96 ^{bc}	7.907 ^a	7.407 ^a
Seed cost	68.52 ^{bc}	144.28 ^{ac}	204.11 ^{ab}
Minerals, medication cost	17.17 ^b	17.91 ^a	17.52
Diesel cost	78.56 ^{bc}	59.24 ^a	50.85 ^a
Repair maintenance	65.15 ^{bc}	51.93 ^a	48.28 ^a
Interest cost	46.87	48.43	46.59
Total direct cost(D)	1183.70	1162.00	1199.57
Return over total direct cost	977.3 ^c	844.37 ^c	589.74 ^{ab}
Fixed cost (F)	218.15 ^{bc}	172.98 ^{ac}	150.35 ^{ab}
Total expenditure (D+F)	1401.89	1335.07	1350
Return over specified Expenses	759.07 ^c	671.3 ^c	439.31 ^{ab}
Land rent	82.17 ^{bc}	74.17 ^{ac}	72.01 ^{ab}
Residual return	676.67 ^c	597.06 ^c	367.26 ^{ab}

Notes

- Superscripts a, b, and c indicate the means differ from those of Systems 1, 2, and 3, respectively at p <0.05
- Residual Return = Total Return - Direct Expense - Fixed Expense - Land Expense

Table 4. Global Warming Potential as kg CO2 Equivalent per Year Among Systems

System	Kg CO2 Equivalent per Year from Different Sources and Total as GWP						
	NPA	EF	CH4 F	N2O F	CO2 F	GWP	GWP/animal
System 1	5859	29401	2276	120970	253994	412499	22917
System 2	4325	29401	819	33164	276142	343850	19103
System 3	3966	29401	2007	36520	242364	314258	17459

Where,

GWP -Net global warming potential (GWP) in kg of CO2 equivalent

NPA-nitrogen fertilizer production and application (NPA),

EF-CH4 emission from enteric fermentation (EF),

CO2 F- the atmospheric CO2 flux.

CH4 F- the atmospheric CH4 flux,

N2O F- the atmospheric NO2 flux

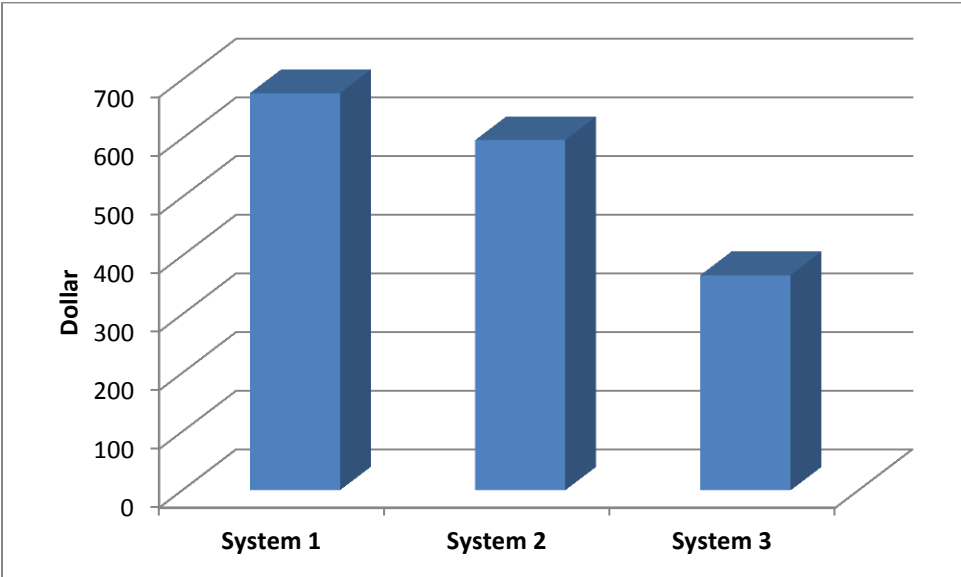


Figure 11. Net profit (dollars) per animal per year

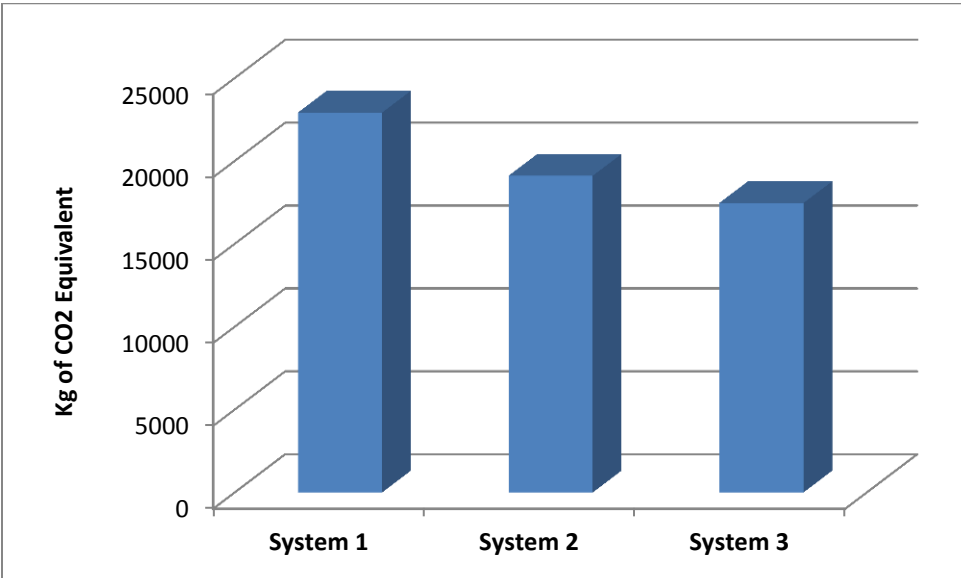


Figure 12. GWP in CO₂ Equivalent per Animal per Year