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Enhancing land and animal productivity with cereal-legume combinations of improved fodder crop varieties under irrigation in Pakistan

Dr Ghulam Mohy Ud Din

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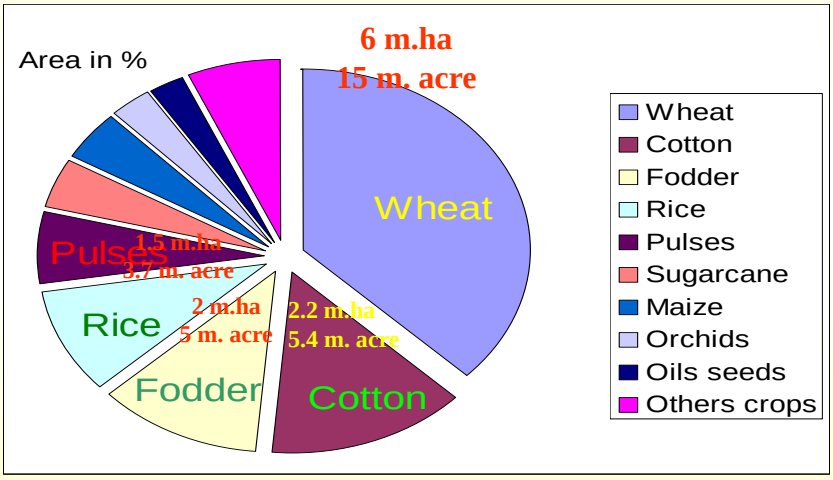
FODDER POSITION AMONG OTHER CROPS in Punjab Pakistan



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PRESENT STATUS OF FODDERS

- FODDER CROPS AREA (Pb.) = 2.027 m.ha.
- FODDER PRODUCTION (Pb.) = 44.44 m.t.
- AV. YIELD OF FODDERS (Pb.) = 22 t.ha.
- SHARE OF FODDER CROPS IN TOTAL CROP AREA = 16%
- ANIMAL HEADS (PUNJAB) = 62.6 m. Heads
- PER HEAD PER YEAR = 0.7t (18 mds)

FODDER AVAILABILITY

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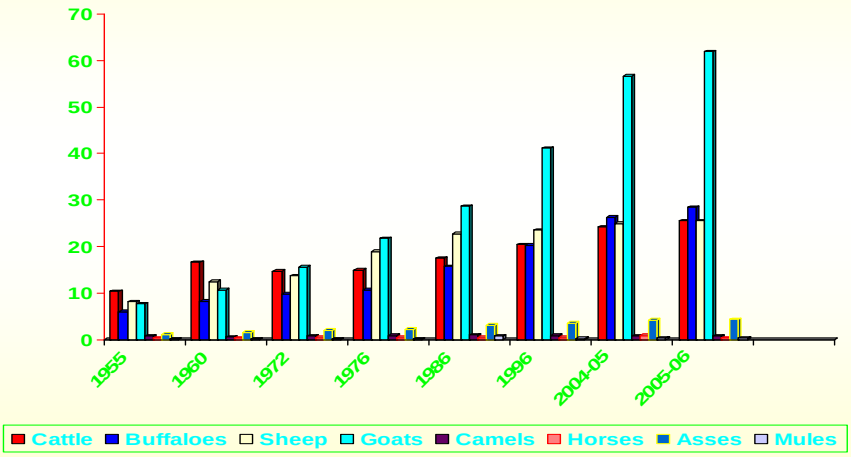
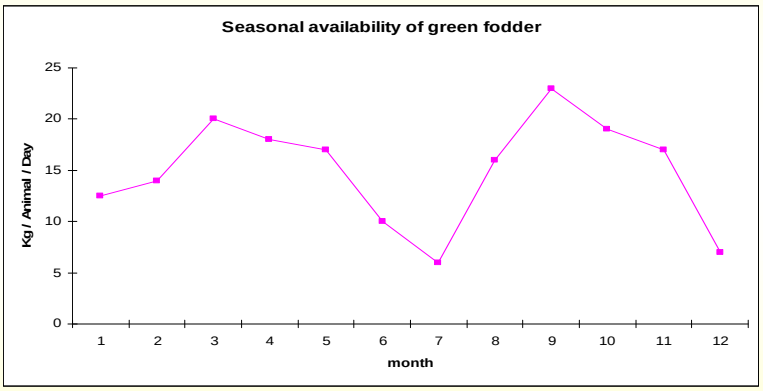
LIVESTOCK POPULATION TREND IN PAKISTAN



SEASONAL AVAILABILITY OF GREEN FODDER



NUTRIENT STATUS (PAKISTAN)

	Req	Availability	Deficiency	% Deficiency
	Million tonnes			
Total Digestible Nutrient (TDN)	90.4	68.7	21.7	24%
Digestible Crude Protein (DCP)	10.9	6.76	4.14	38 %

FEEDING OPTIONS

- 1st Fodder (51%)
  2nd Crop residues (35%)
  3rd Concentrate (8%)
  Oil cakes , Meals (2 %) Cereal by Products (6%)
- Grazing (3%)
- Non conventional feeds (3%)
  (Sugar cane and Corn by products, Vegetable market wastes). **&**

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  Oil cakes , Meals (2 %)
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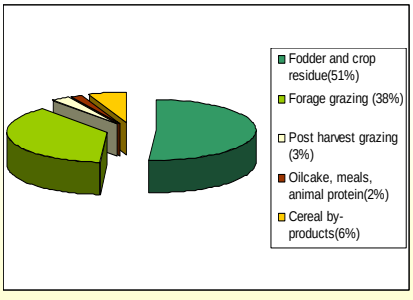
- Grazing (3%)
- Non conventional feeds (3%)
  (Sugar cane and Corn by products, Vegetable market wastes). **&** others
  (Urea Molasses blocks and ammoniated molasses)



MAJOR ISSUES

- 1. Low fodder productivity
- 2. Limited area due to small holdings
- 3. Imbalanced livestock feed
- 4. Inadequate fodder supply during the year
- 5. Non production of quality seed and Lack of seed production mechanism at village level

FODDER CROPS

Summer fodders			2n	Varieties
1.	SORGHUM	(*Sorghum bicolor L.*)	*20*	*JS-2002*
2.	PEARL MILLET	(*Pennisetum americanum*)	*14*	*18-BY*
3.	MAIZE	(*Zea mays*)	*20*	*S-2000*
4.	COWPEAS	(*Vigna ungiculata*)	*22*	*CP-95*
	Winter fodders			
1	BERSEEM	(*Trifolium alexandrinum*)	*16*	*B. Pacchati*
2	OATS	(*Avena sativa*)	*42*	*S-2000*
	Fodders for lean period			
1	*MAIZE (multiple planting)*			
2	SUDAN GRASS x SORGHUM *(Multicut)*	(*Sorghum sudanenses) x Sorghum bicolor L.*)		*Sadabahar*
3.	MOTTGRASS	(Napier purpureum)	*28*	

Forage production

Comparison among improved fodder crop varieties and local fodder crops for yield and nutritive quality,

Comparison among mixed improved cereal fodder crop varieties and legumes fodder crop varieties with sole crop and local fodder crops for yield and nutritive quality,

Conservation of fodder crops through hay

Sustainable seed production

Farmers selected for the activity

No. of farmers selected

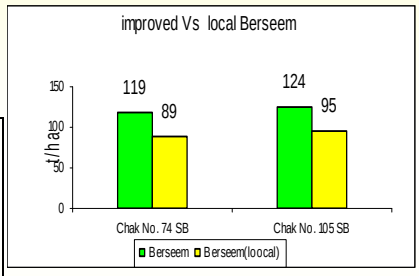
Chak No. 74/sb	21
Chak No. 105/sb	16

Area

15 acres in each village (Improved)
5 acres in each village control
10 acres hay making
3 acres in each village for seed production

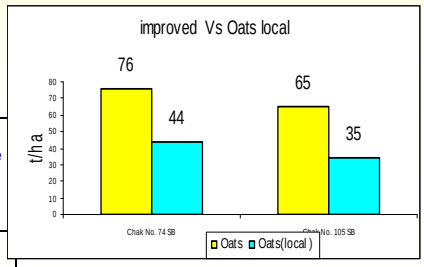
Comparison of average green fodder yield of improved berseem verses local berseem.

Village	No. of farmers	Berseem Improved GFY (t/ha)	Berseem (local) GFY (t/ha)	Percent increase
74/SB	21 (15 acres)	119	89	33.71
105/SB	16 (15 acres)	124	95	30.5



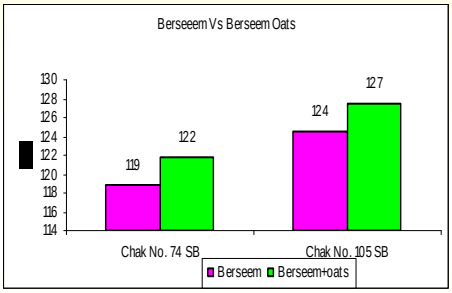
Comparison of average green fodder yield (15 acres) of improved oats verses local oats.

Village	No. of farmers	Oats (Improved) GFY (t/ha)	Oats (local) GFY (t/ha)	Percent increase
74/SB	21 (15 acres)	76	44	72.7
105/SB	16 (15 acres)	65	35	85.7

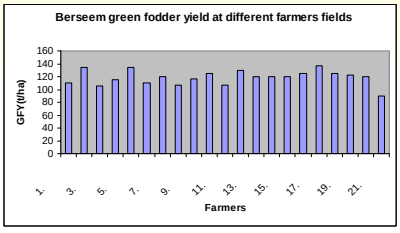


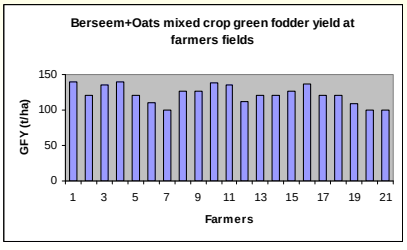
Comparison of average green fodder yield (15 acres) of improved berseem and improved berseem + oats.

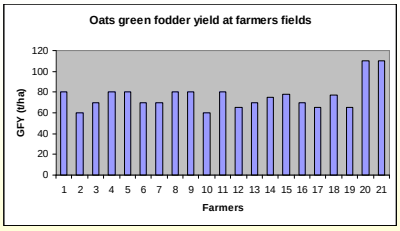
Village	No. of farmers	Berseem Improved GFY (t/ha)	Berseem + oats improved GFY (t/ha)	Percent increase
74/SB	21 (15 acres)	119	122	2.5
105/SB	16 (15 acres)	124	127	2.4

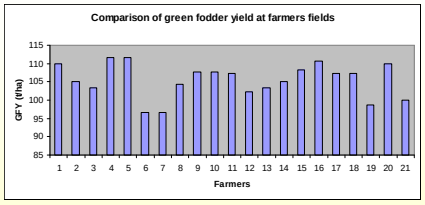


Green fodder yield of Berseem and Oats at farmers fields









COMPARISON OF INCOME FROM FODDER CROPS

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Comparison of income per hac. received from different fodder crops in chak No.74/SB

Crop	Total Income (Rs.000)	Exp. (Rs.000)	Net. Income (Rs.000)	Percent increase
Berseem Improved	60	18	42	100
Berseem (local)	38	17	21	
Oats Improved	23	17	6	50
Oats local	20	16	4	
Berseem Improved	60	18	42	
Berseem + Oats Improved	64	20	44	4.76

ICARDA

Comparison of income per hac. received from different fodder crops in chak No.105/SB

Crop	Total Income (Rs.000)	Exp. (Rs.000)	Net. Income (Rs.000)	Percent increase
Berseem Improved	43	16	27	68.75
Berseem (local)	31	15	16	
Oats Improved	25	17	8	60.00
Oats local	18	13	4	
Berseem Improved	43	16	27	
Berseem + Oats Improved	49	20	29	7.40

Comparison of income per hac. received from different fodder crops in chak No.74/SB

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Crop	T. Income (Rs.000)	Exp. (Rs.000)	Net. Income (Rs.000)	Percent increase
Berseem	60	18	42	
Berseem GFY + Seed	88	18	70	66.66
Oats	23	17	6	
Oats seed	42	17	25	316.66

Green fodder yield in winter fodder crop

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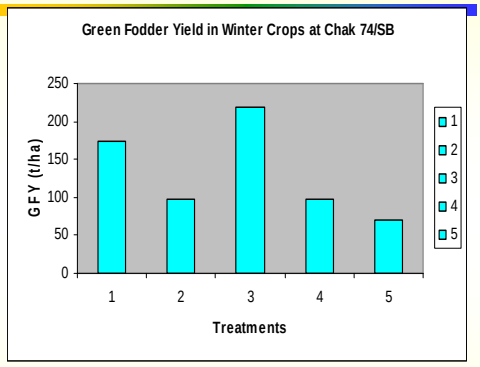
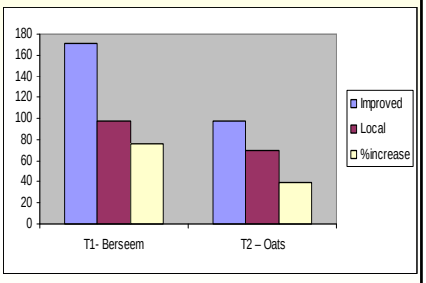
Farmer's Name	GFY (t/ha)	Total
T1 Berseem	26.50 37.5 42.25 38.50 28.40	173.2
T2 oats	97.6	97.6
T3 Berseem +oats	22.10 71.3 62.30 38.0 25.25	219
T4 local Berseem	18, 28.0, 32, 19.5	97.5
T5 local oats	70.3	70.3



AT CHAK NO 74 SB

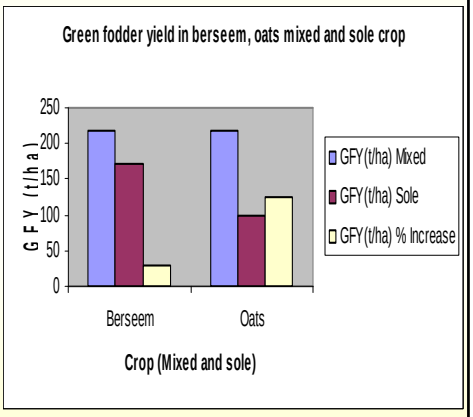
Green fodder yield of Improved and local berseem varieties

	GFY (t/ha)		
	Improved	**Local**	**%increase**
Berseem	**171.15**	**97.5**	**75.54**
Oats	**97.6**	**70.3**	**38.83**



Green fodder yield of Improved and local berseem varieties

	GFY (t/ha)		
	Mixed	Sole	% Increase
Berseem	218.95	171.15	27.93
Oats	218.95	97.5	124.56



Green fodder yield in winter fodder crop

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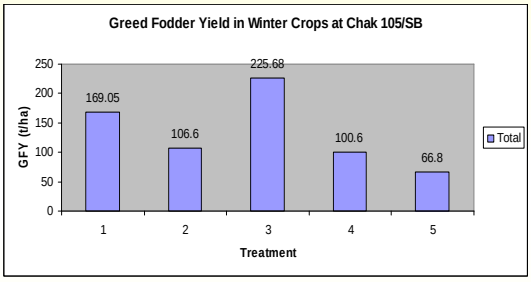
Farmers Name	GFY (t/ha)	Total
T1 Berseem	22.80 37.8 42.75 39.30 26.40	169.05
T2 oats	106.6	106.6
T3 Berseem +oats	25.5 81.33 58.4 35 25 25.2	225.68
T4 local Berseem	15.4 27.0 24.5 21.2 12.5	100.6
T5 local oats	66.8	66.8



AT CHAK NO 105 SB

Green fodder yield of Improved and local berseem varieties

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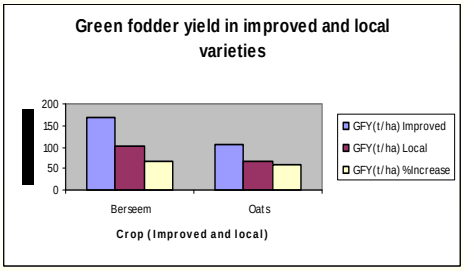
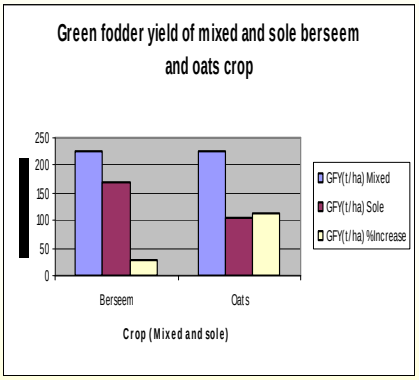
	GFY (t/ha)		
	Improved	Local	% Increase
Berseem	169.05	100.6	68.04
Oats	106.6	66.8	59.58



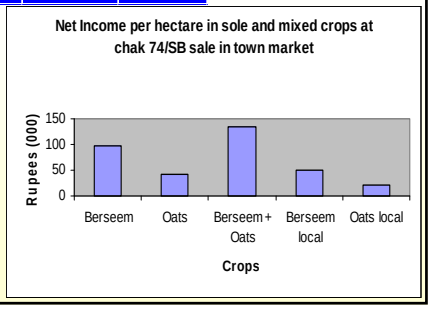
Green fodder yield of Improved and local berseem varieties

	GFY(t/ha)		
	Mixed	Sole	% Increase
Berseem	225.68	169.05	27.93
Oats	225.68	106.6	111.7



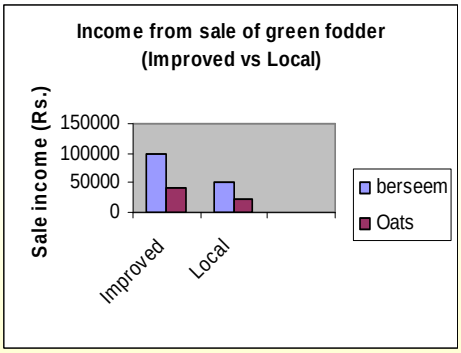
Sale of Green Fodder in chak no. 74/SB in Town Market

Crops	Expense /ha	GFY t/ha	Gross Income /Ha	Net
T1 Berseem	31369	173.2	129900	98531
T2 Oats	30875	97.6	73200	42325
T3 Oats + Berseem mixture	29887	219	164250	134363
T4 Berseem local	22675	97.5	73125	50450
T5 Oats local	30875	70.3	52725	21850



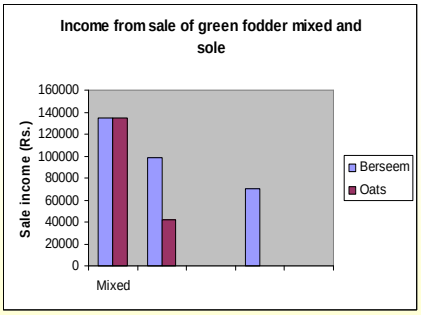
Income from sale of green fodder

	Income/ha		
	Improved	Local	
berseem	98531	50450	95.30
Oats	42325	21850	93.71



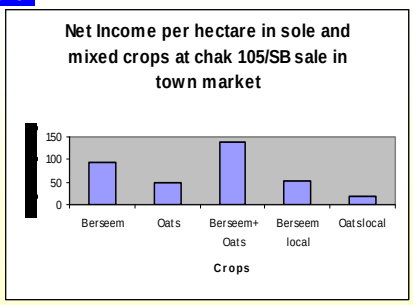
Income from sale of green fodder mixed and sole

	Income	Rupee	
	Mixed	sole	
Berseem	134363	98531	36.36
Oats	134363	42325	217.45
combine		70428	90.78%



Sale of Green Fodder at chak No. 105/SB in Town Market

Crops	Expense /ha	GFY t/ha	Gross Income /Ha	Net
T1 Berseem	31369	169	126750	95381
T2 Oats	30875	106	79500	48625
T3 Oats + Berseem mixture	29887	225	168750	138863
T4 Berseem local	22675	100	75000	52325
T5 Oats local	30875	66	49500	18625



Sale of fodder in the village chak No 74/SB to the livestock holders

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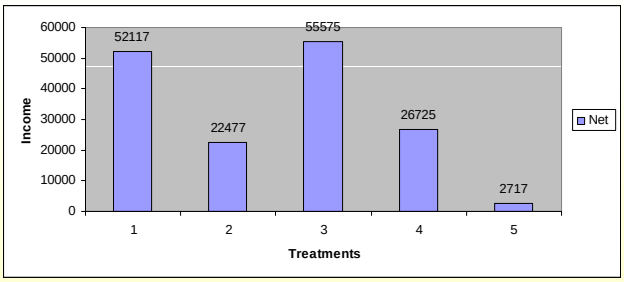
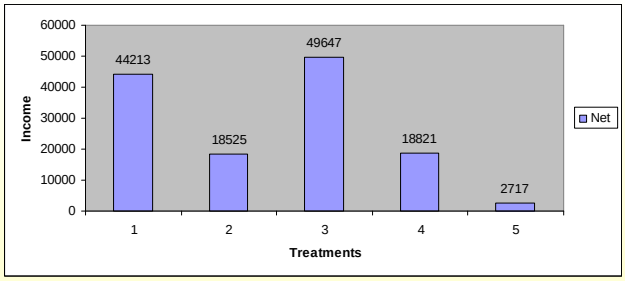
Crops	Expense /ha	Sale Rate /Kanal	Gross Income /Ha	Net
T1 Berseem	17043	3500	69160	52117
T2 Oats	17043	2000	39520	22477
T3 Oats + Berseem mixture	17537	3700	73112	55575
T4 Berseem local	12795	2000	39520	26725
T5 Oats local	17043	1000	19760	2717

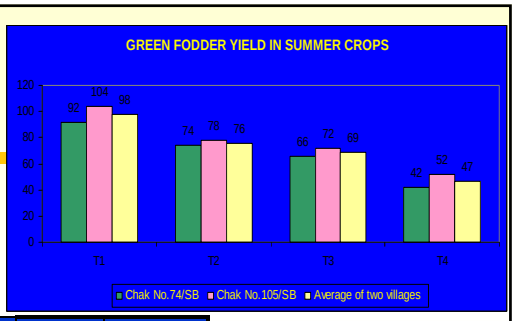


Sale of fodder in the village chak No 105/SB to the livestock holders

Crops	Expense /ha	Sale Rate /Kanal	Gross Income /Ha	Net
T1 Berseem	17043	3100	61256	44213
T2 Oats	17043	1800	35568	18525
T3 Oats + Berseem mixture	17537	3400	67184	49647
T4 Berseem local	12795	1600	31616	18821
T5 Oats local	17043	1000	19760	2717



Average Green fodder yield in Summer fodder crops



Treatments	Crop	Chak 74/SB GFY t ha^{-1}	Chak 105/SB GFY t ha^{-1}	Av. Of both villages t ha^{-1}
T1	Sorghum + pearl millet + maize + cowpeas	92	104	98
T2	Sorghum + pearl millet	74	78	76
T3	Maize alone	66	72	69
T4	Sorghum (farmer's variety and farming practice)	42	52	47

at both villages

(74/SB and 105/SB)

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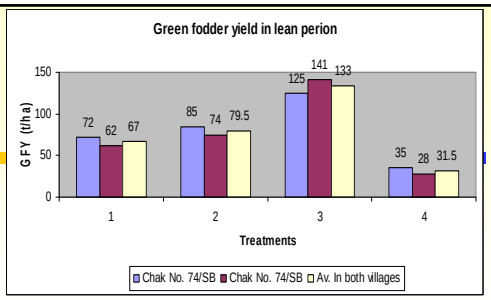
green fodder yield in lean period



Treatments	Crops	Green fodder yield (t/ha)		
		Chak No. 74/SB	Chak No. 105/SB	Av. In both villages
T1	Maize	72	62	67
T2	S-S hybrid	85	74	79.5
T3	Mott grass	125	141	133
T4	Sorghum local	35	28	31.5

In chak No. 74/SB and 105/SB

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income from green fodder sold to the livestock holders

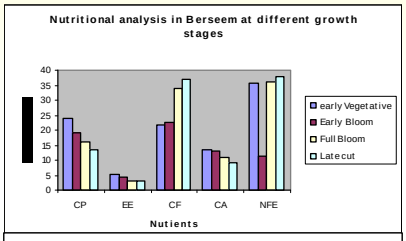
Tr.	Crop	Rate /kanal	GFY/ha	Income/ha	Exp/ha	Net income/ ha	Income/ 45 days
T1	Maize	2000/-	166 (45 d)	39520/-	17290/-	22230/-	22230/-
T2	S-S hybrid	3200/-	196 (120 d)	63232/-	19760/-	43472/-	21736/-
T3	Mott grass	1250/-	328 (120 d)	24700/-	9880/-	14820/-	7410/-
T4	Local sorghum	600/-	78 (45 d)	11856/-	9880/-	1976/-	1976/-

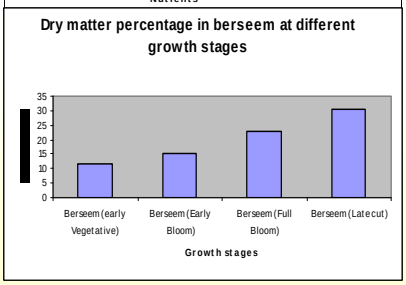
Hay Making

- Dry matter yields
- Crude protein
- Crude fiber
- Ether extract
- Ashes
- Nitrogen free extract

Nutritive analysis in Berseem at different growth stages

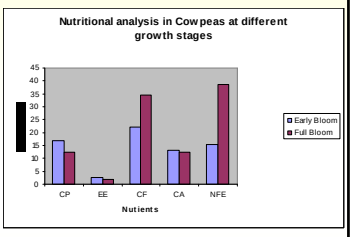
NAME	DM %	CP% of DM	EE% of DM	CF% of DM	CA% of DM	NFE% of DM
Berseem (early Vegetative)	11.6	23.7	5.09	21.85	13.64	35.63
Berseem (Early Bloom)	15.17	19.2	4.14	22.67	12.83	11.16
Berseem (Full Bloom)	22.65	16.09	3.21	33.85	10.94	35.91
Berseem (Late cut)	30.5	13.54	2.94	36.78	8.92	37.82

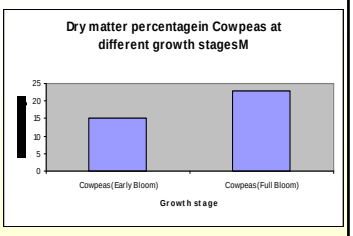




Nutritive analysis in Cowpeas at different growth stages

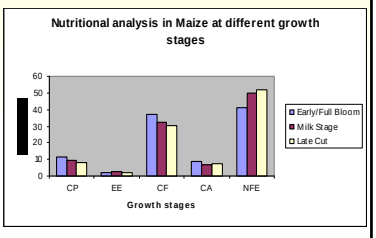
NAME	DM %	CP% of DM	EE% of DM	CF% of DM	CA% of DM	NFE % of DM
Cowpeas (Early Bloom)	15.07	16.88	2.65	22.12	13.05	15.3
Cowpeas (Full Bloom)	23	12.5	1.74	34.66	12.53	38.55

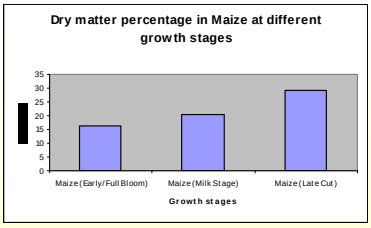




Nutritive analysis in Maize at different growth stages

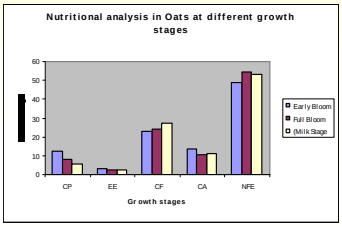
NAME	DM %	CP% of DM	EE% of DM	CF% of DM	CA% of DM	NFE% of DM
Maize (Early/ Full Bloom)	16.07	11.42	1.92	36.89	8.92	40.85
Maize (Milk Stage)	20.4	9.46	2.39	32.1	6.41	49.64
Maize (Late Cut)	29.3	7.76	2.14	30.53	7.51	52.06

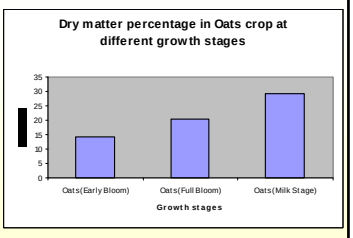




Nutritive analysis in Oats at different growth stages

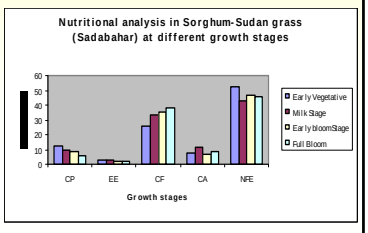
NAME	DM %	CP%of DM	EE%of DM	CF%of DM	CA% of DM	NFE%of DM
Oats (Early Bloom)	14.36	12.1	2.93	22.89	13.31	48.77
Oats (Full Bloom)	20.46	8.25	2.58	24.13	10.43	54.61
Oats (Milk Stage)	29.2	5.36	2.48	27.51	11.27	53.38

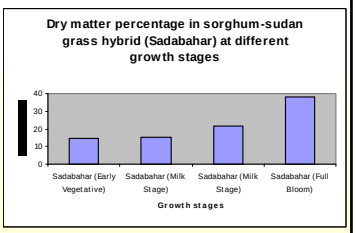




Nutritive analysis in Sorghum-sudan grass hybrid at different growth stages

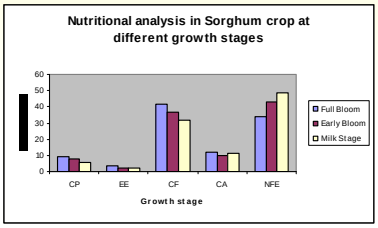
NAME	DM %	CP%of DM	EE%of DM	CF%of DM	CA% of DM	NFE%of DM
Sadabahar (Early Vegetative)	14.7	12.2	2.49	25.7	7.57	52.04
Sadabahar (Milk Stage)	15.4	9.44	2.94	33.21	11.5	42.91
Sadabahar (Milk Stage)	21.45	8.94	1.92	35.34	7.1	46.7
Sadabahar (Full Bloom)	37.8	5.3	1.72	38.33	8.59	46.06

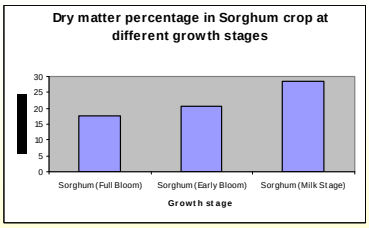




Nutritive analysis in Sorghum at different growth stages

NAME	DM %	CP% of DM	EE% of DM	CF% of DM	CA% of DM	NFE% of DM
Sorghum (Full Bloom)	17.7	9.05	3.4	41.7	11.95	33.9
Sorghum (Early Bloom)	20.78	7.77	2.21	36.86	10.1	43.08
Sorghum (Milk Stage)	28.4	5.96	2.39	31.89	10.95	48.81





SEED PRODUCTION

Seed Produced At Farmers Field at chak No.74/SB

S.No.	Crop	Area sown	Seed produced	Seed yield / Acre	Seed sufficient for
1	Berseem	2 acre	320 kgs	160 kgs	53 acres
2	Oats	2 acre	2200 kgs	1100 kgs	69 acres

Seed Produced At Farmers Field at chak No.105/SB

S.No.	Crop	Area sown	Seed produced	Seed yield / Acre	Seed sufficient
1	Berseem	2 acre	440 kgs	220 kgs	73 acres
2	Oats	2 acre	2600 kgs	1300 kgs	81 acres

Income from seed crop at chak No.74/SB

S.No.	Crop	Rate/kg	Seed Yield/ha	Income/ha	Exp/ha	Net incomeha
1	Berseem	100/-	395 kgs	39520/- (from seed) 69160/- (from fodder local sale)	17043/-	91637
2	Oats	25/-	2717 kgs	67925/-	17043/-	50882/-

Income from seed crop at chak No.105/SB

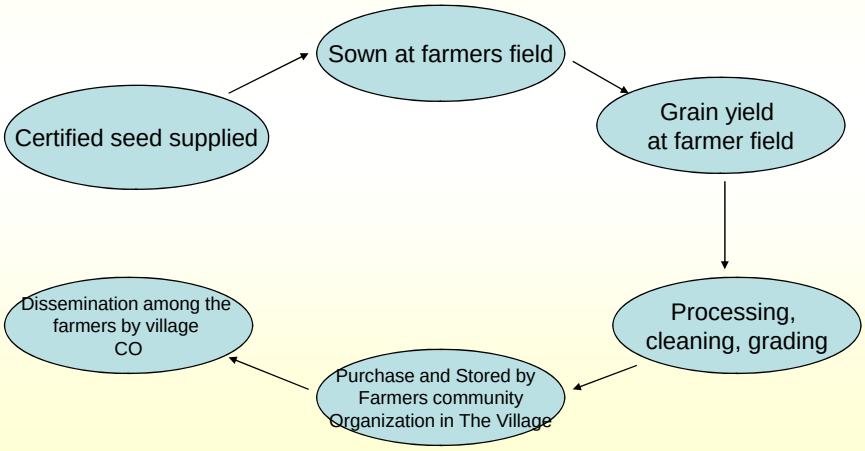
S.No.	Crop	Rate/kg	Seed Yield/ha	Income/ha	Expenditure/ ha	Net income/ha
1	Berseem	100/-	543 kgs	54340/(from seed) 61256/-(from fodder local sale)	17043/-	98553
2	Oats	25/-	3211 kgs	80275/-	17043/-	63232

Seed production in summer crops

Crop	Seed yield/ Acre at chak 74/SB	Seed yield/Acre at chak 105/SB
Sorghum	430 kgs	320 kegs
Pearl millet	480 kgs	270 kegs
Maize	1000 kgs	780 Kgs
Cowpeas	600 kgs	450 Kgs

STRATIGY FOR SUSTAINABLE SEED PRODUCTION AT FARMERS FIELDS

(Through Farmers Community Organizations)



Live stock productivity

- Feeding regimes effect on;
- Milk yield
- Milk fat %age
- Fattening (Meat production)

Feeding during winter

- **Feeding regimes in three groups of animals**
- G1 Fodder of improved varieties + concentrate (balanced).
- G2 Fodder of improved varieties
- G3 Local Fodder
-
- Improved vaieties;
- Berseem = Pacchati
- Oats = S-2000

The milch animals of similar lactation stage were selected to fed on 3 feeding regimes

Chak No. 74SB

	Farmers	Buffallow	Cow
T1	7	15	8
T2	8	10	7
T3	7	7	6
T4	7	5	6
Total	29	37	27 (64)

Chak No. 105

	Farmers	Buffallow	Cows
T1	6	14	8
T2	5	7	4
T3	5	5	2
T4	5	4	6
Total	21	30	20 (50)

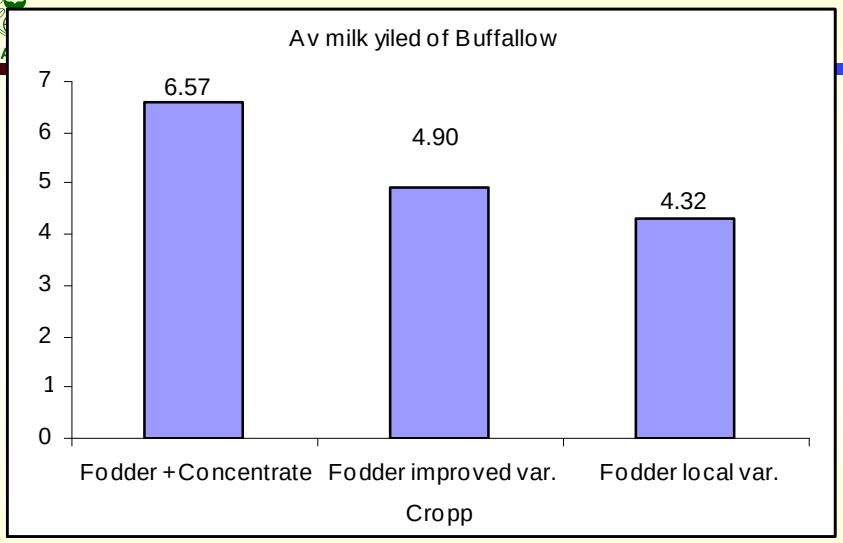
Ingredients % age in the formula

(Improved feed concentrates)	
Cotton seed cake	15
Wheat Bran	20
Maize gluten	20
Maize oil cake	10
Rice Polishing	15
Molsis	14
DCP	1
Salt	1
Mustard cake	4

Cheaper	
Cotton seed cake	5
Maize gluten	30
Oil	1
Rice bran	32
Molsis	15
DCP	1
Salt	1
Mustard cake	15

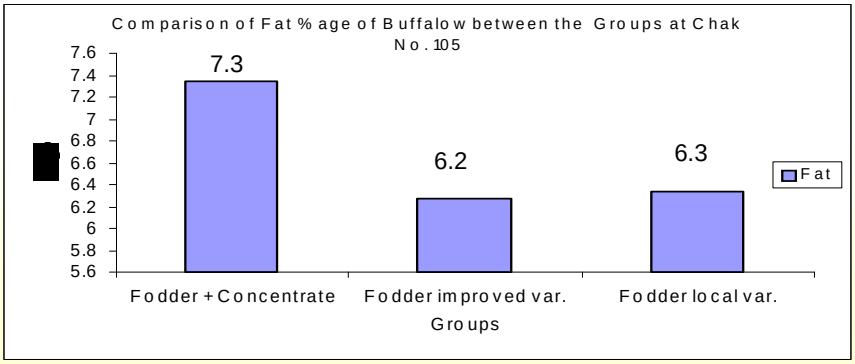
Effect of feeding regimes on milk yield Average of buffalo in chak No. 74 and 105/SB

No. of animals	Feeding group	Milk yield (liters)	Percent increase over local fodder
8	Fodder + Concentrate	6.57	52.0
8	Fodder improved var.	4.90	13.4
8	local Fodder	4.32	-



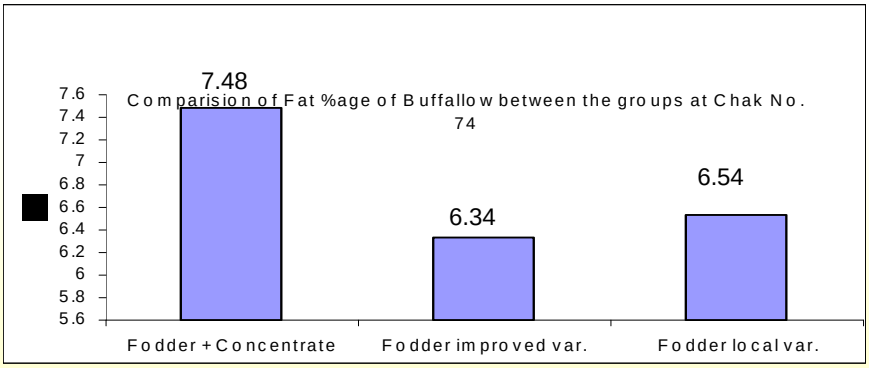
Average Fat % age of milk of Buffallow in chak No.105/SB

Villages	No of animals	Groups	Fat % age	Percent increase
105/SB	13	Fodder + Concentrate	7.3	15.8
"	12	Fodder improved var.	6.2	- 1.58
"	4	Fodder local var.	6.3	



Average Fat % age of milk of Buffallow in Chak No.74/SB

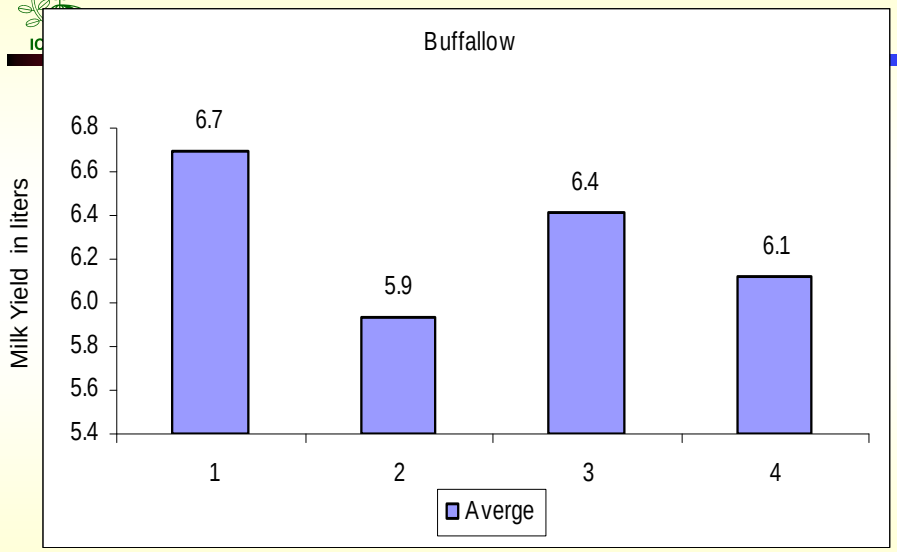
Villages	No of animals	Groups	Fat % age	Percent increase
74/SB	14	Fodder + Concentrate	7.48	14.4
"	12	Fodder improved var.	6.34	-3.05
"	10	Fodder local var.	6.54	



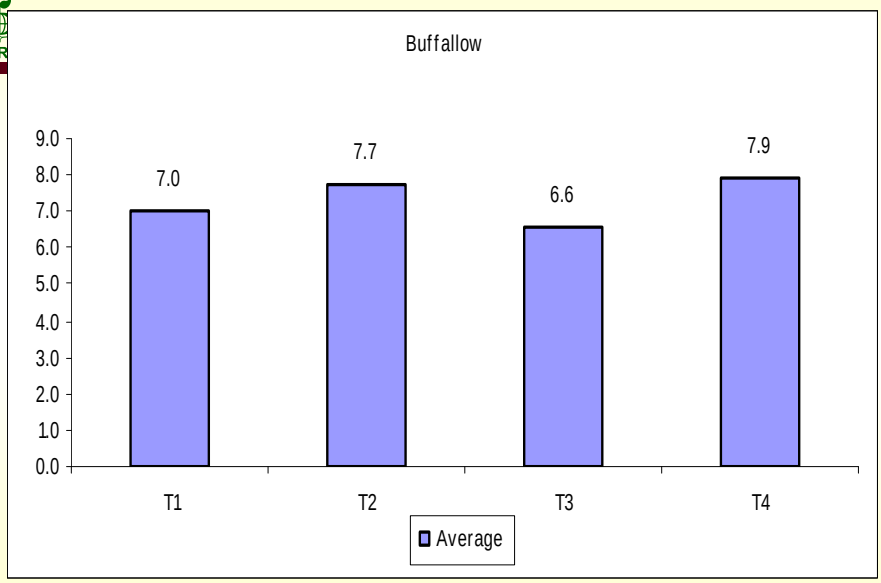
TYPOLOGIES STUDY

1	Relatively large land / animal holding / income	
2	Medium land / animal holding /	income
3	Small land / animal holding /	income
4	Smallest land / animal holding /	income

COMPARISON OF AV MILK YIELD AMONG DIFFERENT TYPOLOGIES GROUPS Chak No. 74

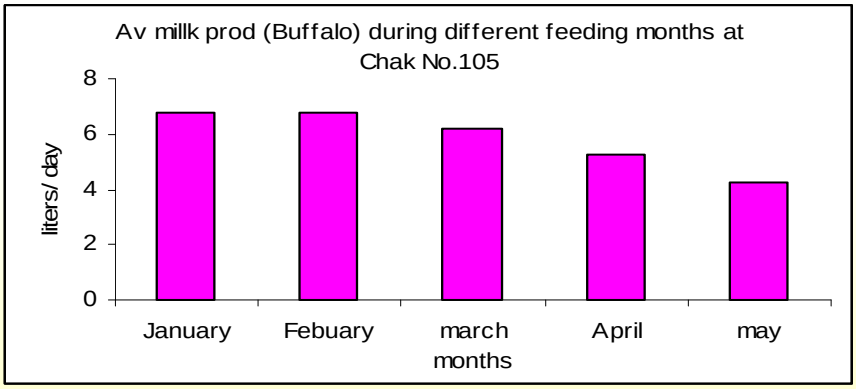


COMPARISON OF AV MILK YIELD AMONG DIFFERENT TYPOLOGIES GROUPS Chak No. 105



Variation in milk yield among different farmers during different months

January	February	March	April	May
6.8	6.8	6.2	5.3	4.2



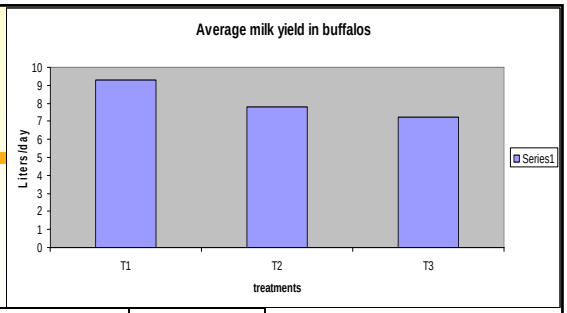
Feeding during summer

- T1. Improved fodder and concentrate
- T2. Improved fodder
- T3. Local fodder

- Fodder crop varieties;
  - » Sorghum = JS-2002
  - » Pearl millet = 18-BY
  - » Maize = S-2000
  - » Cowpeas = CP-95

ICARDA

Average milk yield of buffaloes

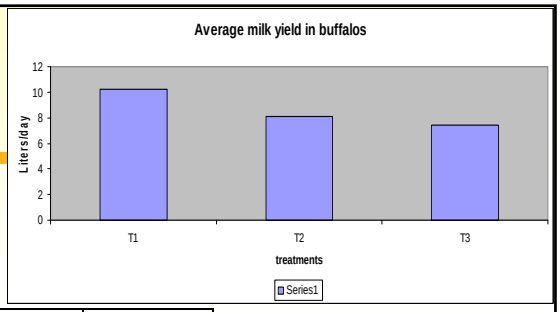


Feeding Group	No. of Animals	Av. Milk Yield (Liters)/ animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	14	9.30	27.66
Improved Fodder Var. with cotton seed cake	12	7.82	8.16
Local Fodder with cotton seed cake	8	7.23	

in chak No. 74/SB

ICARDA

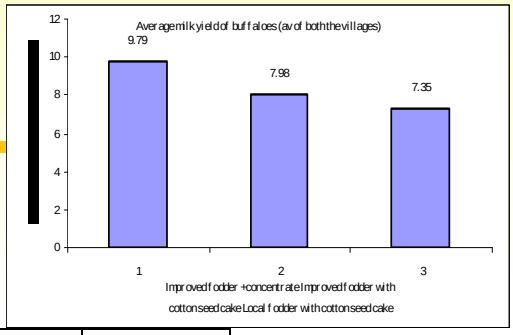
Average milk yield of buffaloes



Feeding Group	No. of Animals	Av. Milk Yield (Liters)/animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	15	10.25	37.58
Improved Fodder Var. with cotton seed cake	16	8.10	8.72
Local Fodder with cotton seed cake	10	7.45	

in chak No. 105/SB

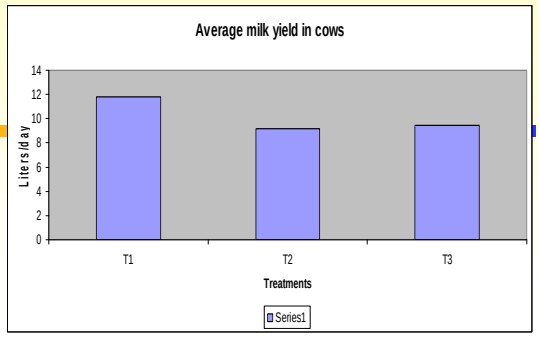
Average milk yield of buffaloes



Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	29	9.79	33.13
Improved Fodder Var. with cotton seed cake	28	7.98	8.50
Local Fodder with cotton seed cake	18	7.35	

(Av. of both the villages)

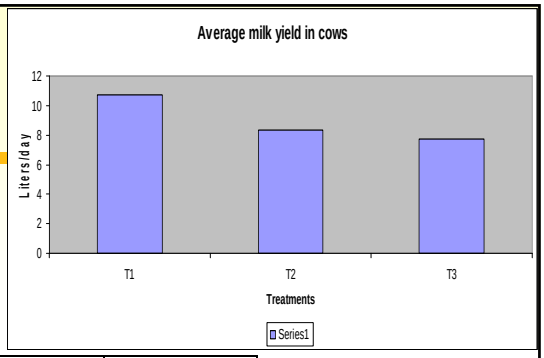
Average milk yield of cow



Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	15	11.80	24.87
Improved Fodder Var. with cotton seed cake	4	9.62	2.65
Local Fodder with cotton seed cake	6	9.45	

in chak No. 105/SB

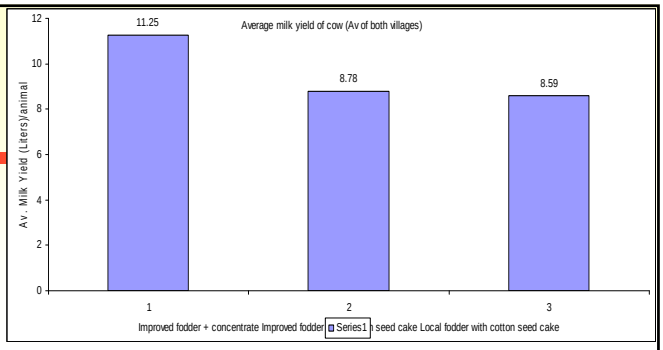
Average milk yield of cow



Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	7	10.7	38.42
Improved Fodder Var. with cotton seed cake	9	8.35	8.02
Local Fodder with cotton seed cake	5	7.73	

in chak No. 74/SB

Average milk yield of cow

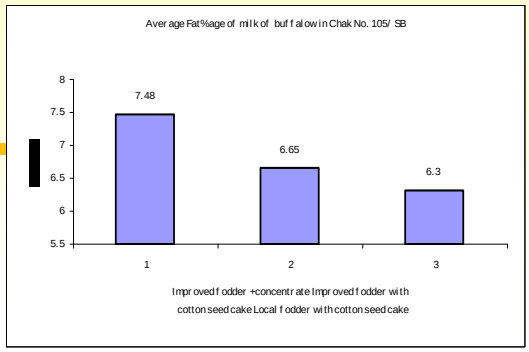


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	12	11.25	30.97
Improved Fodder Var. with cotton seed cake	13	8.78	2.15
Local Fodder with cotton seed cake	11	8.59	

(Av of both villages)

Average Fat% age of milk of buffaloes

ICARDA

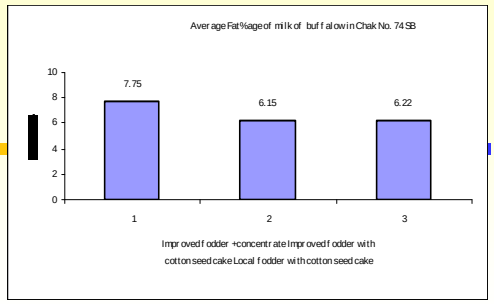


Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	15	7.48	18.73
Improved Fodder Var. with cotton seed cake	16	6.65	4.56
Local Fodder with cotton seed cake	10	6.30	

in Chak No. 105/ SB

Average Fat% age of milk of buffaloes

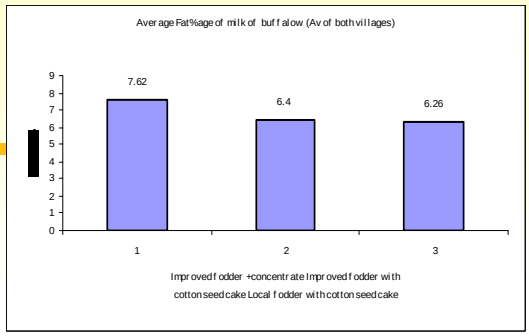
ICARDA



Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	14	7.75	24.60
Improved Fodder Var. with cotton seed cake	12	6.45	1.13
Local Fodder with cotton seed cake	8	6.22	

in Chak No. 74 SB

Average Fat% age of milk of buffaloes



Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	29	7.62	21.65
Improved Fodder Var. with cotton seed cake	28	6.40	2.24
Local Fodder with cotton seed cake	18	6.26	

(Av of both villages)

Economic of fattening of Buffalo calves at Chak No. 74/SB

Rationing Group	Grou No.		Age	Initial Weight (kg)	Improved Weight (kg)	Increase in Weight (kg)	Weight gain/calf/day(gm)
Fodder Improved	1	2	6	65	79	14	233
	2	3	12	87	119	32	533
Fodder + concentrate	1	3	6	73	88	15	250
	2	4	12	108	159	51	850
Fodder Local	1	4	6	50	65	15	250
	2	4	12	80	109	29	483

Economic of fattening / benefit of Buffalo Calves at Chak no. 74/SB

Rationing Group	No. of Calves	Age Month	Expenditure /calf/day (Rs)	Weight gain/Calf/day (kg)	Price @ Rs. 75/kg (lw)	Net Benefit/ calf/day (Rs.)
Fodder Improved	3	12	20	0.5333	40	20
Fodder + concentrate	4	12	30	0.850	64	34
Fodder Local	4	12	20	0.483	36	16

Economic of fattening of Buffalo calves at Chak No. 105/SB

Rationing Group	Group No.		Age	Initial Weight	Improved Weight	Increase in Weight	Weight gain/calf/day(gm)
Fodder Improved	1	3	6	63	75.6	12.6	210
	2	3	12	88	128	36	600
Fodder + concentrate	1	4	6	76	91	15	250
	2	3	12	112	152	50	830
Fodder Local	1	4	6	52	65.8	13.8	230
	2	3	12	56	115	30	500

Economic of fattening/benefit of Buffalo calves at Chak no. 105/SB

Rationing Group	No. of Calves	Age Month	Expenditure /calf/day (Rs)	Weight gain/Calf/day (kg)	Price @ Rs. 75/kg (lw)	Net Benefit/ calf/day (Rs.)
Fodder Improved	3	12	20	0.600	45	25
Fodder of + concentrate	3	12	30	0.830	62	32
Fodder Local	3	12	20	0.500	37.5	17.5

Economic of fattening / benefit of Cow calves at Chak no. 74/SB

Rationing Group	No. of Calves	Age Month	Expenditure/calf/ day (Rs)	Weight gain/Calf/day (kg)	Price @ Rs. 75/kg (lw)	Net Benefit/ calf/ day (Rs.)
Fodder Improved	3	12	20	0.400	30.0	10.0
Fodder of concentrate	2	12	30	0.700	52.5	22.5
Fodder Local	3	12	20	0.383	28.72	8.7

Economic of fattening / benefit of Cow calves at Chak No. 105/SB

Rationing Group	Group No.		Age	Initial Weight	Improved Weight	Increase in weight	Weight gain/calf/day (kg)
Fodder Improved	1	2	4	51	69	18	0.300
	2	1	8	89	121	32	0.533
Fodder + concentrate	1	2	4	56	76	20	0.333
	2	3	8	240	288	48	0.800
Fodder Local	1	2	4	46	66	20	0.333
	2	2	8	98	128	30	0.500

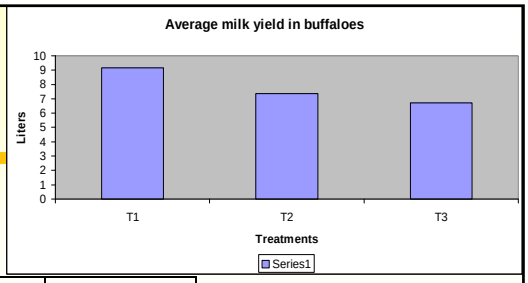
Economic of fattening / benefit of Cow calves at Chak No. 105/SB

Rationing Group	No. of Calves	Age Month	Expenditure/calf/day (Rs)	Weight gain/Calf/day (kg)	Price @ Rs. 75/kg (lw)	Net Benefit/ calf/ day (Rs.)
Fodder Improved	3	12	20	0.533	39.97	19.97
Fodder + concentrate	2	12	30	0.800	60.00	30
Fodder Local	3	12	20	0.500	37.50	17.50

SUMMER

- Improved fodder cropvarieties;
  Sorghum, pearl millet, maize and cow peas

Average milk yield in buffalos

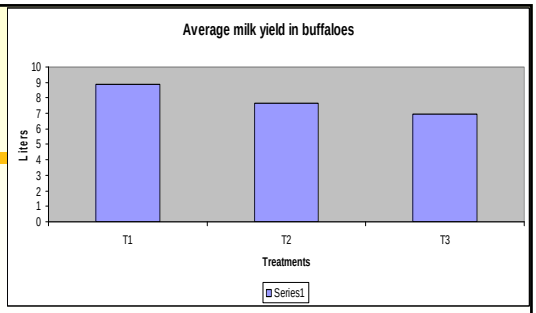


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	7	9.15	35.95
Improved Fodder Var. with cotton seed cake	9	7.38	9.66
Local Fodder with cotton seed cake	5	6.73	

at Chak No. 74/ SB

Average milk yield in buffalos

ICARDA

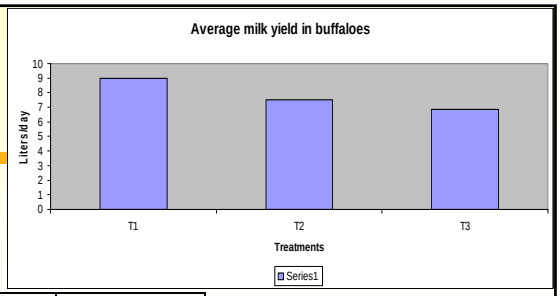


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	9	8.88	28.14
Improved Fodder Var. with cotton seed cake	7	7.65	10.39
Local Fodder with cotton seed cake	11	6.93	

at Chak No. 105/ SB

Average milk yield in buffalos

ICARDA

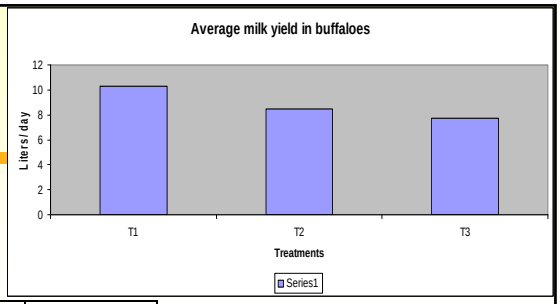


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	16	9.00	31.00
Improved Fodder Var. with cotton seed cake	16	7.50	9.17
Local Fodder with cotton seed cake	16	6.87	

at both the villages

Average milk yield of cow

ICARDA

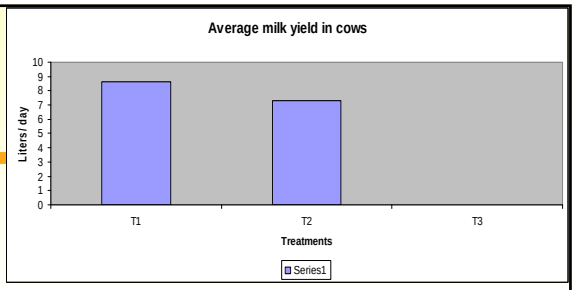


Feeding Group	No. of Animals	Av. Milk Yield (Liters)/ animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	8	10.3	32.9
Improved Fodder Var. with cotton seed cake	6	8.45	9.03
Local Fodder with cotton seed cake	4	7.75	

in chak No. 105/SB

Average milk yield of cow

ICARDA

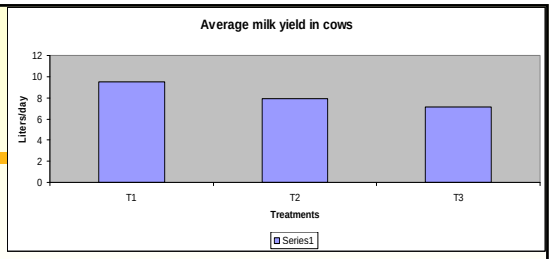


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	7	8.65	28.72
Improved Fodder Var. with cotton seed cake	5	7.30	8.63
Local Fodder with cotton seed cake	6	6,72	

in chak No. 74/SB

Average milk yield of cow

ICARDA

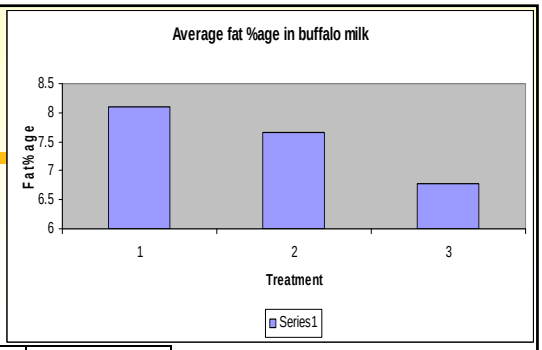


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	15	9.53	33.66
Improved Fodder Var. with cotton seed cake	11	7.93	11.22
Local Fodder with cotton seed cake	10	7.13	

(Av of both villages)

Average Fat% age of milk of buffalos

ICARDA

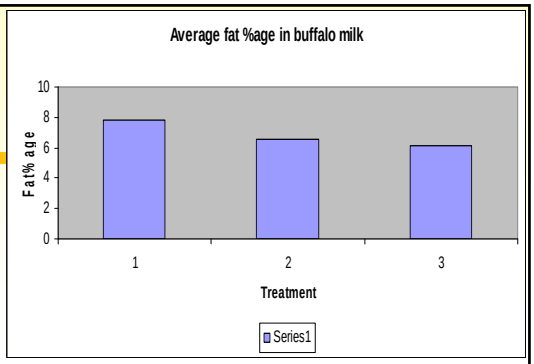


Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	7	8.10	19.46
Improved Fodder Var. with cotton seed cake	9	7.66	12.98
Local Fodder with cotton seed cake	5	6.78	

in Chak No. 74/ SB

Average Fat% age of milk of buffalos

ICARDA

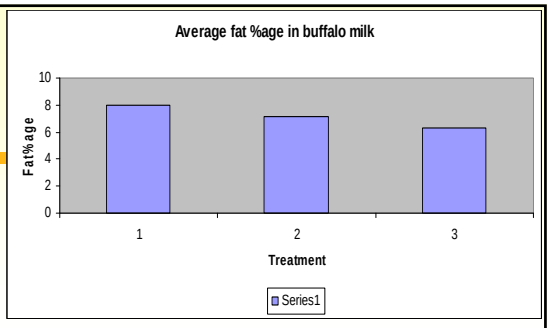


Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	9	7.84	28.11
Improved Fodder Var. with cotton seed cake	7	6.55	7.03
Local Fodder with cotton seed cake	11	6.12	

in Chak No. 105/ SB

Average Fat% age of milk of buffalos

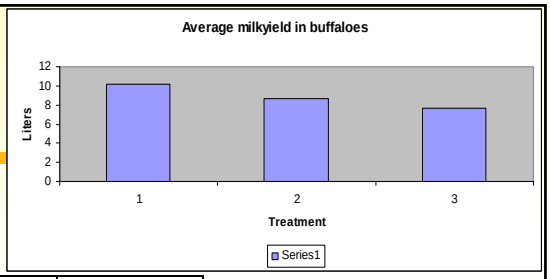
ICARDA



Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	16	7.95	25.79
Improved Fodder Var. with cotton seed cake	16	7.17	13.45
Local Fodder with cotton seed cake	16	6.32	

in both villages

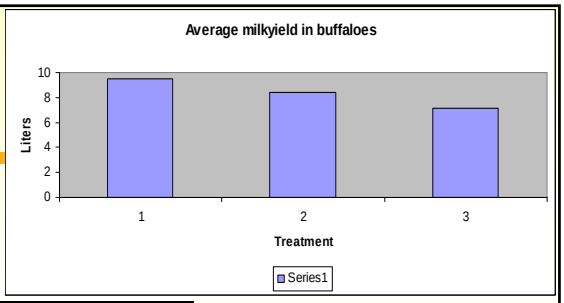
Average milk yield of buffaloes



Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	12	10.2	32.99
Improved Fodder Var. with cotton seed cake	11	8.65	12.78
Local Fodder with cotton seed cake	15	7.67	

in chak No. 74/SB

Average milk yield of buffaloes

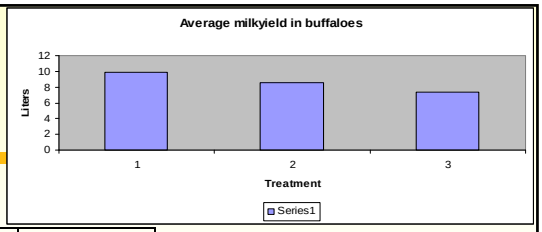


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	13	9.50	32.24
Improved Fodder Var. with cotton seed cake	11	8.40	17.81
Local Fodder with cotton seed cake	14	7.13	

in chak No. 105/SB

Average milk yield of buffaloes

ICARDA

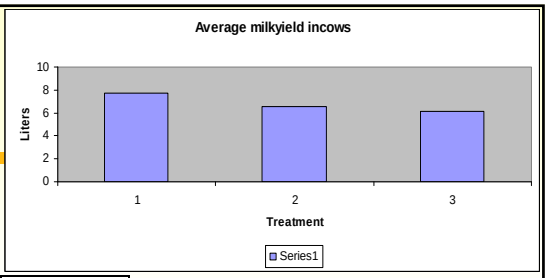


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	25	9.84	32.79
Improved Fodder Var. with cotton seed cake	22	8.53	15.11
Local Fodder with cotton seed cake	29	7.41	

(Av of both villages)

Average milk yield of cow

ICARDA

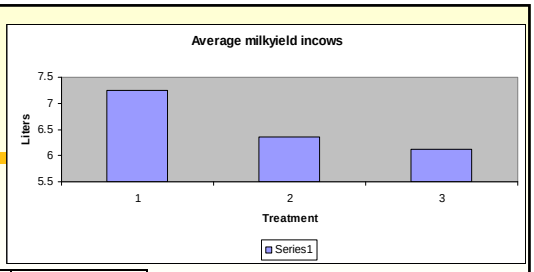


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	8	7.70	26.23
Improved Fodder Var. with cotton seed cake	6	6.55	7.38
Local Fodder with cotton seed cake	7	6.10	

in chak No. 74/SB

Average milk yield of cow

ICARDA

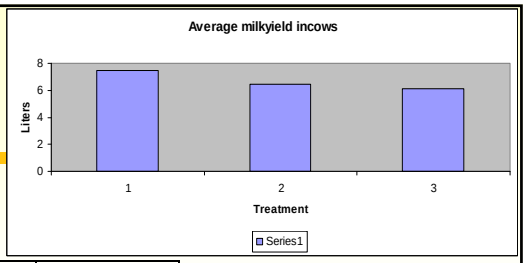


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	7	7.25	14.17
Improved Fodder Var. with cotton seed cake	6	6.35	3.76
Local Fodder with cotton seed cake	6	6.12	

in chak No. 105/SB

Average milk yield of cow

ICARDA

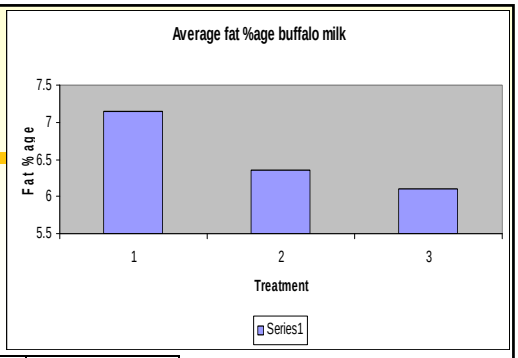


Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	15	7.49	22.59
Improved Fodder Var. with cotton seed cake	12	6.45	5.56
Local Fodder with cotton seed cake	13	6.11	

(Av of both villages)

Average Fat% age of milk of buffalos

ICARDA

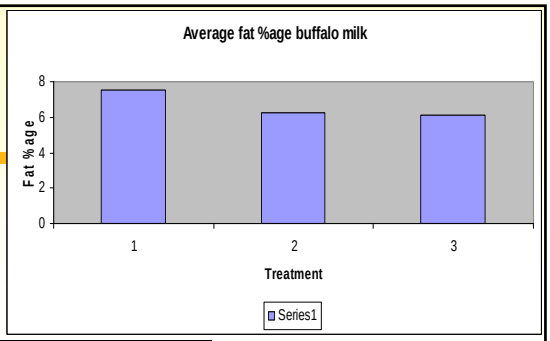


Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	12	7.15	17.21
Improved Fodder Var. with cotton seed cake	11	6.35	4.09
Local Fodder with cotton seed cake	15	6.10	

in Chak No. 74/ SB

Average Fat% age of milk of buffalos

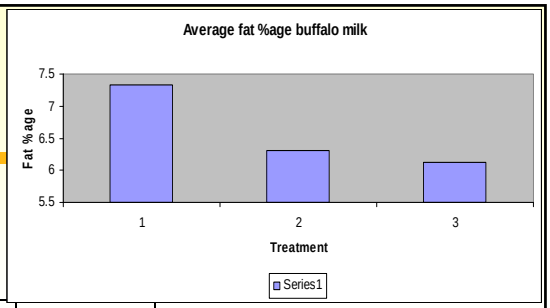
ICARDA



Feeding Group	No. of Animals	Fat % age	Percent increase over local fodders
improved fodder + concentrate (balanced)	13	7.50	21.95
Improved Fodder Var. with cotton seed cake	11	6.24	1.46
Local Fodder with cotton seed cake	14	6.15	

in Chak No. 105/ SB

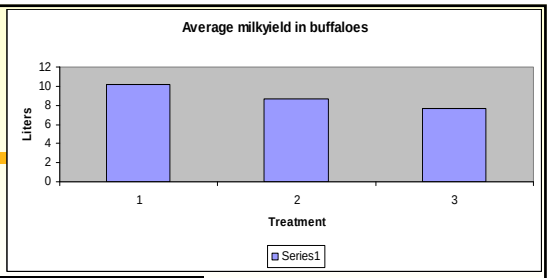
Average Fat% age of milk of buffalos



Feeding Group	No. of Animals	Fat %age	Percent increase over local fodders
improved fodder + concentrate (balanced)	25	7.33	19.77
Improved Fodder Var. with cotton seed cake	22	6.30	2.94
Local Fodder with cotton seed cake	29	6.12	

(Av of both villages)

Average milk yield of buffaloes



Feeding Group	No. of Animals	Av. Milk Yield (Liters) /animal	Percent increase over local fodders
improved fodder + concentrate (balanced)	12	8.2	17.42
Improved Fodder Var.HAY MIXED with cotton seed cake	11	7.65	11.51
Local Fodder with cotton seed cake	15	6.86	

ICARDA

Breed Improvement