

**Table 4.10 Ownership of other livestock by district**

		Bungoma	Kakamega	Kisii	Nandi	Nyamira	Rachuonyo	Vihiga
Number of agricultural households		145	269	259	121	237	156	308
Local chicken	%	67.6	77.3	78.8	84.3	74.6	84.7	77.5
	mean	9.0	8.1	10.1	10.9	7.3	10.3	7.4
Layers	%	3.4	4.1	6.6	5.0	7.2	5.7	4.2
	mean	5.2	5.3	20.1	12.2	16.5	11.4	10.2
Broilers	%	0	0	0	0	0	0	0.7
	mean	0	0	0	0	0	0	12.0
Pigs	%	18.6	0	0	0	0	0	0
	mean	1.7	0	0	0	0	0	0
Sheep	%	24.1	15.2	9.3	47.1	10.2	20.4	7.2
	mean	3.2	2.6	2.9	4.0	2.7	4.9	1.9
Local goats	%	3.4	3.0	29.3	9.9	26.3	58.6	17.3
	mean	2.4	3.1	3.1	6.3	2.7	4.7	1.9
Dairy goats	%	2.8	0.4	1.2	3.3	0.8	3.2	3.9
	mean	2.5	3.0	2.3	2.8	3.5	3.2	2.2

The other livestock were dairy goats were kept in 4% of the households in Vihiga, 3% in Nandi, Rachuonyo and Bungoma, but less than 1% in Kakamega and Nyamira. Broiler chicken were found in only 0.7% of agricultural households in Vihiga. Pigs were only noted in Bungoma in 18% of agricultural households.

**Table 4.11 Ownership of other livestock by household category**

Category		With cattle	No cattle	Zebu only	Zebu + Dairy	Dairy only
Number of households		1021	474	440	441	132
Local goats	%	24.6	12.0	26.7	21.6	27.6
	mean	3.5	3.0	3.7	3.2	3.5
Dairy goats	%	2.7	0.6	2.3	3.0	3.7
	mean	2.5	3.7	2.8	1.8	3.6
Sheep	%	20.4	5.7	21.0	18.9	23.9
	mean	3.5	2.0	3.4	3.5	3.9
Local poultry	%	82.0	67.9	81.3	82.5	84.3
	mean number	9.6	6.4	9.0	9.3	12.0
Broilers	%	< 1%	0	2.7	0.5	1.5
	mean	12		1.75	1.5	3
Pigs	%	1.7	2.1	2.7	<1%	1.5
	mean	1.4	1.8	1.8	1.5	3

Most households (80%) kept local chicken while less than 15% of households with no cattle kept other livestock as well (Table 4.11). All households with different classes of cattle (Zebu only, dairy type cattle only or the combination) had other livestock.

## 4.8 Cattle production systems and feed resources

### 4.8.1 Production systems

Fifty six percent of households with dairy cattle mostly fed them on grass (pasture) with some stall-feeding, while 22% just grazed them (Table 4.12). Stall-feeding alone (zero-grazing) is practiced by only 5% of the households, whereas 17% of the households supplement these stall-fed animals with a little grazing. For those keeping Zebus, forty eight percent of the households mainly grazed their Zebu cattle while 45% grazed their Zebus with some stall-feeding (Table 4.13).

**Table 4.12 Frequency of production systems for dairy animals**

	Overall	Bungoma	Kakamega	Kisii	Nandi	Nyamira	Rachuonyo	Vihiga
Number of households	575	27	40	143	98	123	1	143
Only grazing (free range / tethering)	22	22	35	8	52	11	100	20
Mainly grazing + some stall feeding	56	67	40	72	44	64	0	45
Mainly stall + some grazing	17	11	10	15	2	19	0	31
Only stall (zero-grazing)	5	0	15	6	2	6	0	4

Stall-feeding (zero-grazing) with or without some grazing was most common in Vihiga with 35% of the households in the district while. Kakamega and Nyamira had 25%; Kisii 21% and Nandi had only 4%. Zero-grazing was almost non-existent in Rachuonyo where cattle are grazed.

**Table 4.13 Frequency of production systems for zebu animals**

	Overall	Bungoma	Kakamega	Kisii	Nandi	Nyamira	Rachuonyo	Vihiga
Number of households	555	62	123	73	9	48	105	135
Only grazing (free range / tethering)	48	47	37	10	78	29	92	51
Mainly grazing + some stall feeding	45	53	62	77	22	56	8	37
Mainly stall + some grazing	5	0	2	11	0	13	0	10
Only stall (zero-grazing)	1	0	0	3	0	2	0	1

There was less grazing as one moved from households with Zebu only to those that kept dairy grades only but the change is marginal (84 to 78% of the households with cattle) (Table 4.14). Only 21% of households keeping dairy types alone and 23% of households with the combination of zebu and dairy types practised stall-feeding (zero-grazing), with or without some grazing.

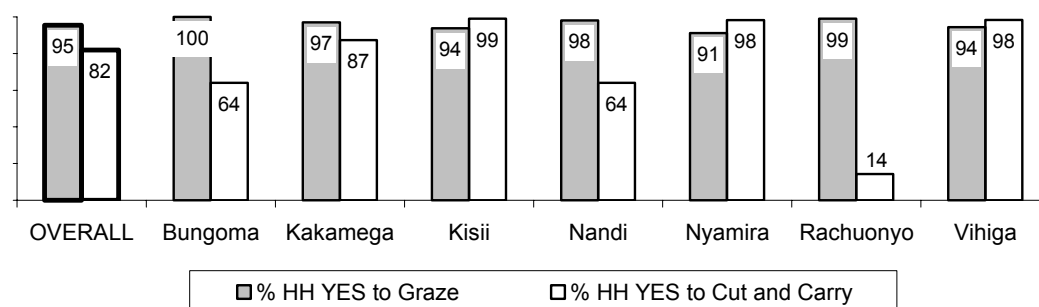
**Table 4.14 Frequency of livestock production systems by household category**

	Zebu only	Zebu + Dairy	Dairy only
Number of households	28	427	115
Only grazing (free range / tethering)	50.0	18.0	28.0
Mainly grazing with some stall feeding	36.0	59.0	51.0
Mainly stall with some grazing	11.0	17.0	18.0
Only stall (zero-grazing)	4.0	6.0	3.0

#### 4.8.2 Feeding systems

Ninety five percent of all households with cattle said they grazed their animals at one time or another, and 82% provided their cattle with cut and carry forage, either as a sole practice or as a supplement to grazing (Figure 4.24).

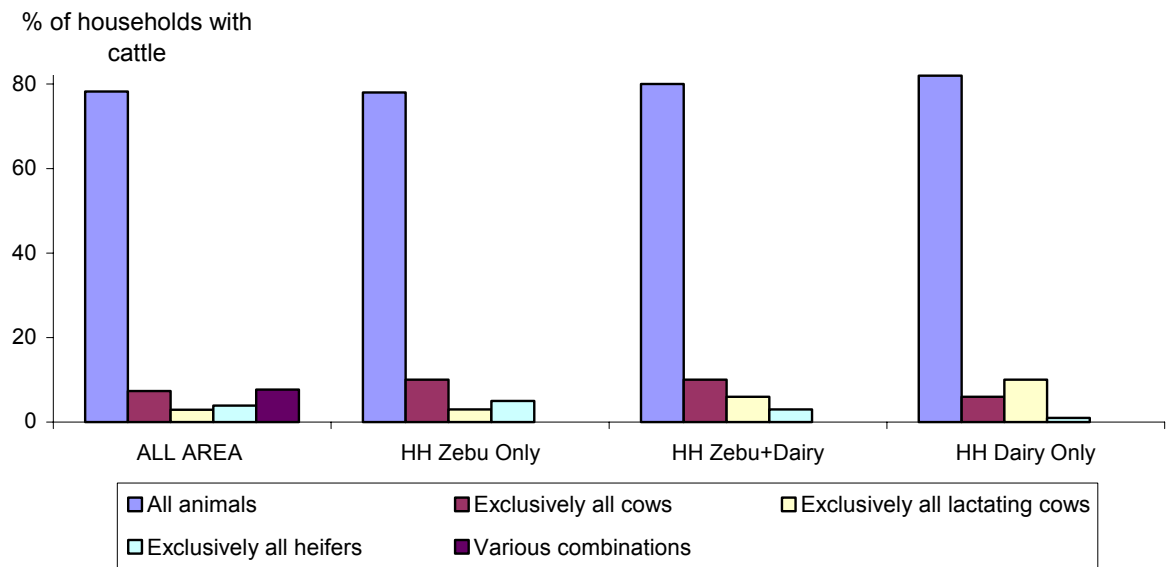
**Figure 4.24 Proportion of households that graze cows or cut and carry fodder**



Eighty two percent of households keeping dairy grades only indiscriminately gave cut and carry forage to all groups of cattle while 80% of households keeping the combination (Zebu and dairy grade) and 78% of the households keeping Zebu only did the same (Figure 4.25). Ten percent of households keeping dairy grade types alone gave cut and carry forage exclusively to lactating cows while the same proportion of households with the other categories of livestock gave the forage to cows whether lactating or not. Going by the definition of stall-feeding, it is worth noting that in drought all animals are stall-fed regardless of the type of animal. The shortage of land and increasing intensification means animals are increasingly being stall-fed.

Over 84% of all households with cattle said they experienced feed shortage. This response ranged from 72% in Kisii to 98% in Rachuonyo (Figure 4.26). Currently, the most popular strategies undertaken during feed shortage included taking the cattle out of the homestead for pasture elsewhere (24% of households), using cut and stored forage (9%) as well as purchased fodder (19%) (Figure 4.27).

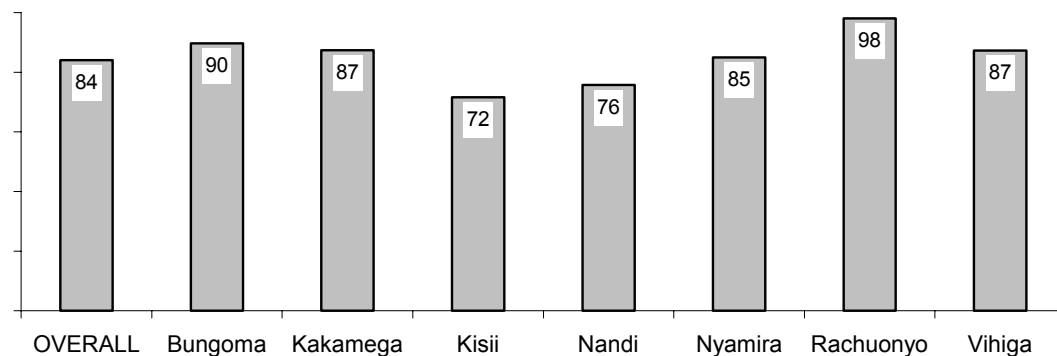
**Figure 4.25 Animals given cut and carry fodder**



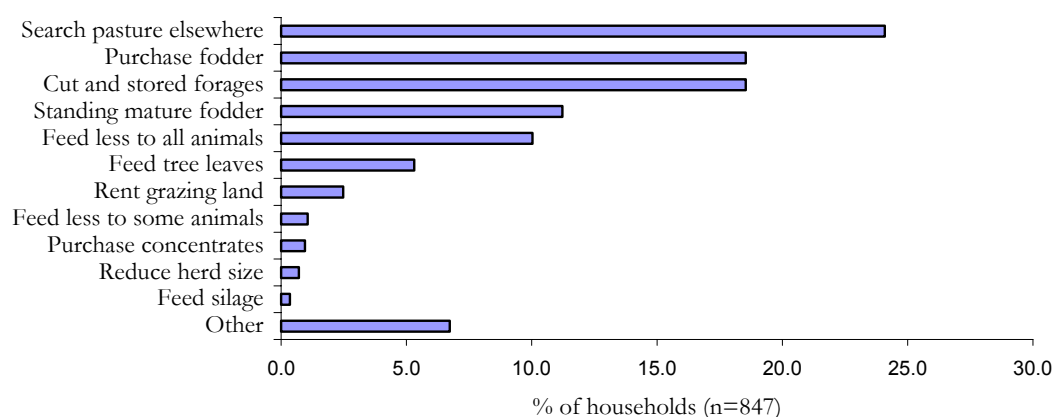
Only 16% of all the households supplemented pasture and forage with concentrates, this ranged from none in Rachuonyo to 47% in Nandi (Figure 4.28). More households keeping a combination of Zebu and dairy grade cows used concentrates (29%), than those keeping dairy grades alone (22%) and Zebu alone (2%).

Fewer households in Kisii than elsewhere showed they had experienced feed shortage. This is so since the rain patterns there are different than in the other districts allowing the availability of forage most of the year. Sugar cane was clearly not a prominent feed resource despite its heavy presence in the area. Sugarcane tops dry up very fast and by the time of harvesting mature cane, the feeding value to animals is at its lowest.

**Figure 4.26 Percentage of households experiencing feed shortages**

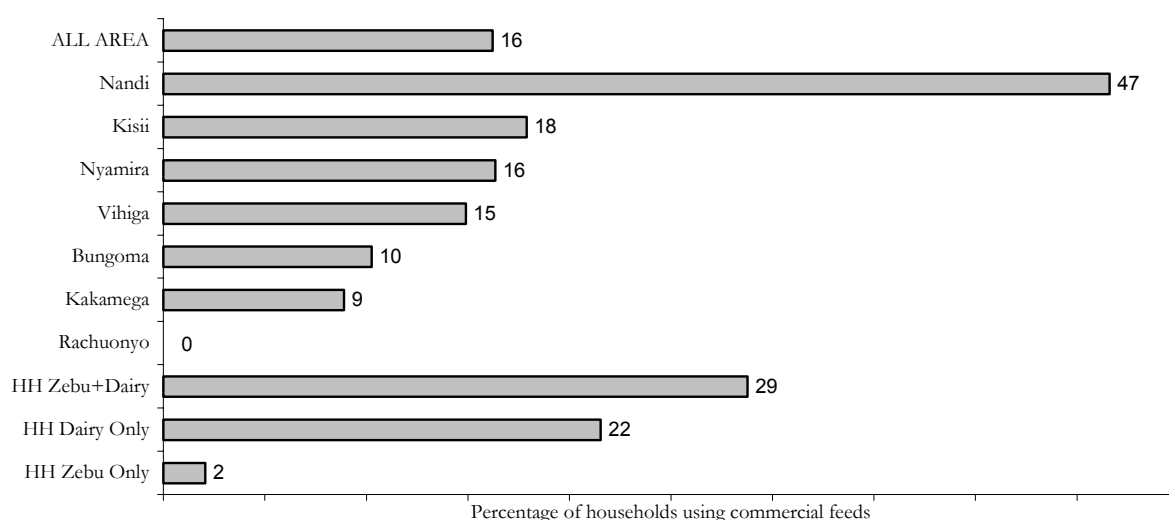


**Figure 4.27 Percentage of household and strategies taken in feed shortage**



Dairy meals were used in 77% of all the households (Figure 4.28) using concentrates. Nandi had 16% of the households giving reject maize grains after harvesting as a concentrate, where it is given as ground meal or whole.

**Figure 4.28 Percentage of households supplementing pasture/fodder with concentrates**



### 4.8.3 Use of tree and pasture legumes

Very few households (14 out of the total 1,012 with cattle or 1.4%) reported the use of herbaceous legumes as feed for animals (Table 4.15). On the other hand, 254 households (25% of households with Cattle) had legume trees. The highest percentages of these were in Nyamira 41%, followed by Vihiga 35% of households with cattle. The most common legume tree was Sesbania, planted by 41% of those having legume trees (or 7% of households with cattle), followed by Calliandra (22%, or 4% of households with cattle) (Table 4.16). Grevillea was also pointed out as legume tree by 23% of households with the forage.

**Table 4.15 Numbers of households with and using pastures and forage legumes**

	Overall	Kakamega	Kisii	Nandi	Nyamira	Vihiga
Number of households with pasture legumes	14	1	3	2	4	4
<i>Desmodium</i>	10		2		4	4
<i>Lucerne</i>	2	1		1		
<i>Other, Russian Comfrey</i>	1			1		
<i>Other, Sweet Potato</i>	1		1			

It is worth noting here that pastures were used broadly to capture planted improved fodders and both pastures and leys were lumped together as pastures.

The reported relatively high presence of tree legumes was not indicative of the extent to which they are used as livestock feed. It would be useful to consider quantities actually used. As so many farmers though not a tree legume, indicated *Grevillea*.

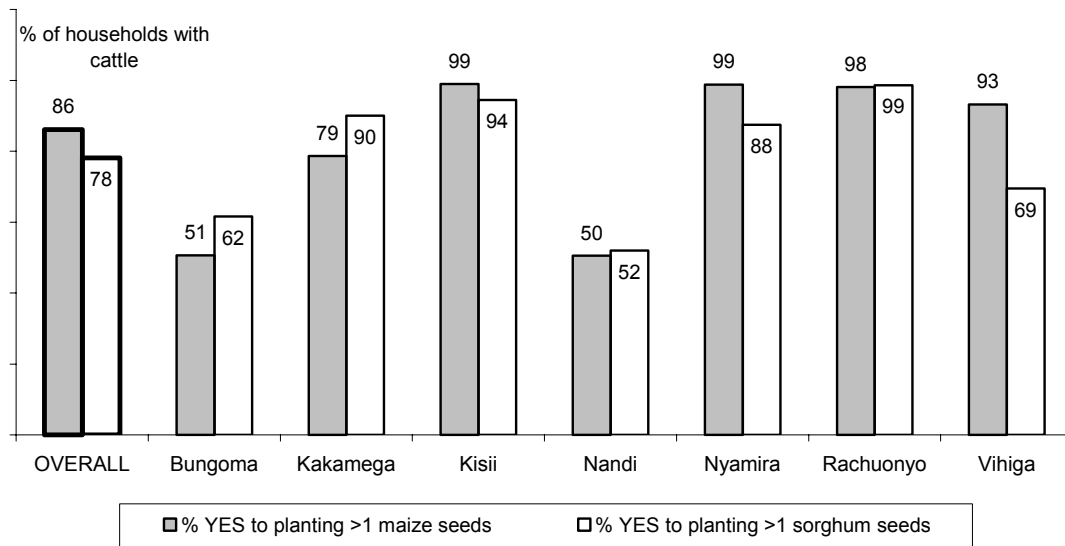
**Table 4.16 Numbers of households with and using pastures and tree legumes**

	Overall	Bungoma	Kakamega	Kisii	Nandi	Nyamira	Rachuonyo	Vihiga
Number of households with legumes trees	254	12	28	46	7	67	12	82
% households with cattle	24.9	14.6	20.3	24.1	6.8	41.1	11.2	34.7
<i>Sesbania</i>	41.3	33.3	50.0	39.1	42.9	34.8	0	51.9
<i>Calliandra</i>	22.2	25.0	17.9	30.4	0	10.6	0	33.3
<i>Leucaena</i>	8.3	33.3	14.3	0	0	3.0	50	6.2
<i>Tithonia</i>	1.2	0	7.1	0	0	1.5	0	0
<i>Others</i>	1.2	0	7.1	0	0	0.0	0	1.2
<i>Grevillea</i>	22.6	8.3	3.6	28.3	28.6	42.4	50	7.4
<i>Indigenous trees</i>	3.2	0	0	2.2	28.6	7.6	0	0

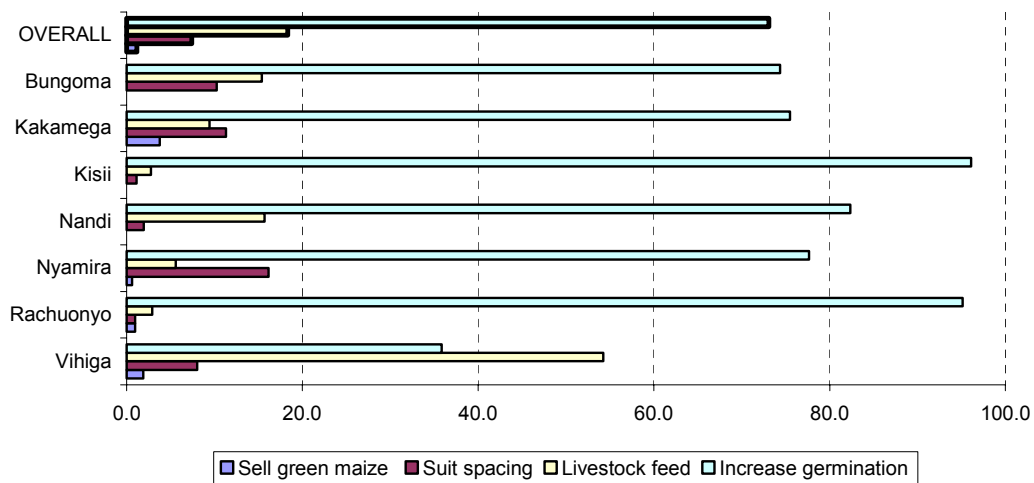
#### 4.8.4 Use of maize and sorghum as fodder

Eighty six percent and 78% of households with cattle planted more than one maize seed and more sorghum seeds per hole or line, respectively, than recommended rates (Figure 4.29). The main reason for this (given as first reason by 73% of the households answering for maize and 84% of the households answering for sorghum) is to increase germination, (Figure 4.30). On the other hand 40% of households keeping Zebu plus dairy types planted more maize seeds so as to later feed livestock, compared with 37% who did so to increase germination.

**Figure 4.29 Percentage of households planting many maize/sorghum seeds per hole**

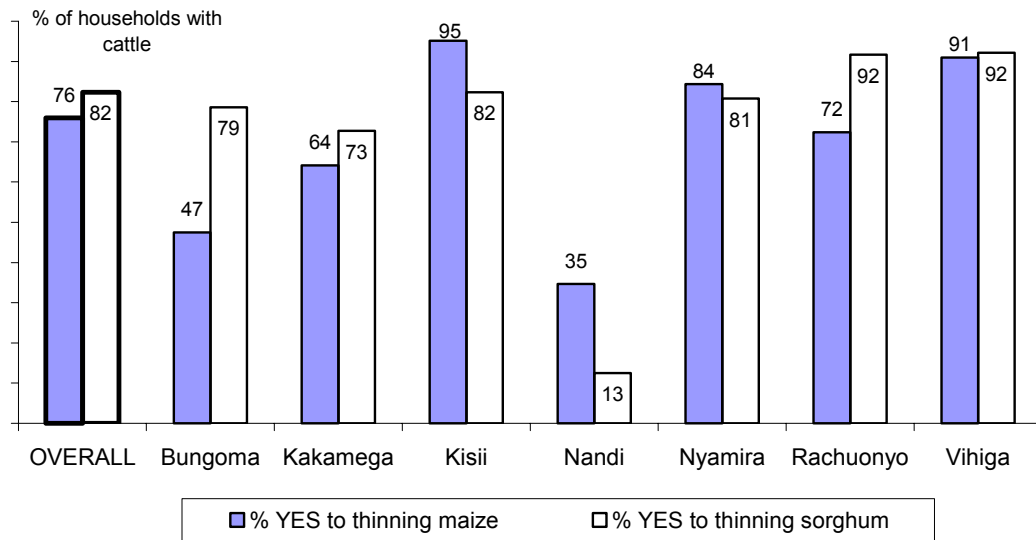


**Figure 4.30 Reasons for planting many maize/seeds**



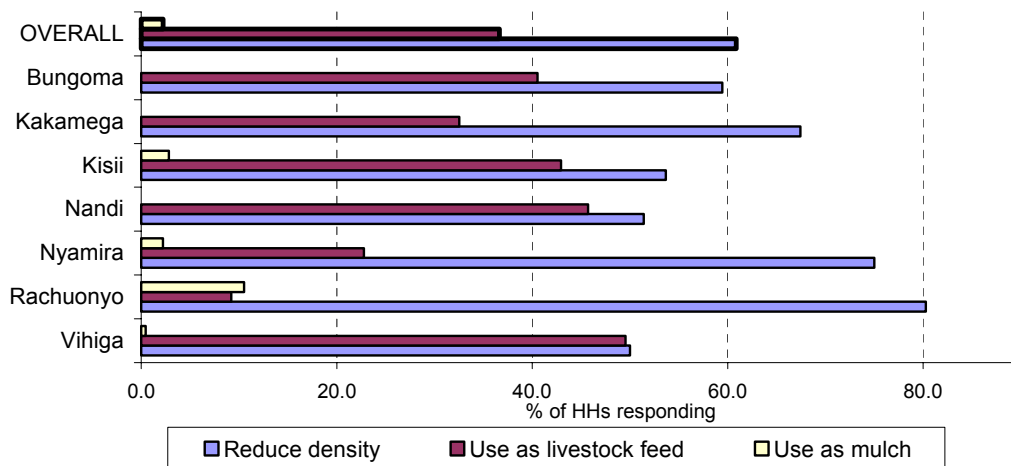
In all the districts, 76% of the agricultural households with maize and 82% of those with sorghum thinned the crops, (Figure 4.31).

**Figure 4.31 Percentage of households thinning maize and sorghum**



The main reasons for thinning maize (Figure 4.32) was to reduce density (61% of the households) and to use the thinnings as livestock feed (37% of the households) while the reasons for thinning the crop were largely to use the leaves as livestock feed (70% of the households) and, less importantly, to reduce crop density (60% of the households in Nyamira).

**Figure 4.32 Reasons for thinning maize**



Eighty four percent of the households thinned sorghum to reduce density and very few stripped the crop. Stripping/defoliating was done by 70% of the households to feed livestock. The highest rates were in Bungoma and Vihiga at 90% and Nandi at 93% while the lowest was Rachuonyo at 42%. 22% stripped/defoliated to reduce density while 6% use the material as mulch with the highest occurrence being 36% in Rachuonyo.

## 4.9 Livestock management services

### 4.9.1 Long term credit

Only 38 (2.5%) of all the agricultural households had ever obtained long-term credit for use in their farms (Table 4.17). Twenty of them used the credit to purchase improved dairy cattle.

**Table 4.17 Number of households that have received farming long term credit**

District	Overall	Bungom a	Kakameg a	Kisii	Nandi	Nyamira	Rachuony o	Vihiga
Total number households used credit	38	6	5	1	9	5	1	11
Purchase improved dairy animals	20	4	3		6	4		3
Cattle housing	1							1
Purchase of feed	2				1			1
Dairy equipment	2				2			
Loan of cattle	5			1		1		3
Other	8	2	2				1	3

Non-use of long-term credit was common in this area because 44% of the households did not know about it. Rachuonyo led with 64%, Vihiga and Nyamira 48% and Kisii at 46%. Nineteen percent never thought about getting it, and 18% were afraid of being unable to pay back (Figure 4.33 and Figure 4.34).

**Figure 4.33 Reasons for not getting credit**

