

WCE À o v}v }ÿ}vž š μ• OE •• v v}v KOEVP Ÿ}vw
••}] š &]v v] o >}••Ç]U <]v] }μvš

2VRUR 0\$2PEXL -*1DWKXUDDQ3%0ZDQJL :(

i %o CEšu v š } (s š OE]v OEÇ ^ CEÀ] U <.]]] }μvšÇ ' }À CEvu v š U <.]] U < vÇ
i %o CEšu v š } (Wμ o] , o š Z U } Ç] P Q U } P Ç] À v CE •] š Ç } (E] OE }] U E] OE }] U < vÇ
i %o CEšu v š } (o] v] o ^ š μ] • U hv] À CE •] š Ç } (E] OE }] U E] OE }] U < vÇ

}CECE}v] v f z } k e v o e u %o CE š u } (Wμ o] o š Z U } Ç] P Q U } P Ç] À v CE •] š Ç } (E] OE }] U E] OE }] U < vÇ
o %o Z u }] Ç } P u] o X } u

Z] À š W E } À u CE î ô U î î î U D v μ • CE] P Q U } P Ç] À v CE •] š Ç } (E] OE }] U E] OE }] U < vÇ
Z] À š W E } À u CE î ô U î î î U Y ZE] X • / W : V D W î r î ô î ô î CE î ô U î î î U D v μ • CE] P Q U } P Ç] À v CE •] š Ç } (E] OE }] U E] OE }] U < vÇ
š W u CE î ñ U î î î U K / W î X î ô î ô î ñ ô î r ñ ô î X ó X í X í ô

]š š] K • WCE } D U K E U μ } š Z μ CE W U - D î Á î v P V CE À (o] v] š }] Z v š μ • CE K • CE P v v } v u w š } } v
••}] š &]v v] o >}••] v <.]]] }μvšÇ U < vÇ X : WCE À D s } o X í o E } X í W í o ð X

• š OE š

v μ u CE] } } } (v } ÿ] • • • š OE v • u] Ç Z CE } μ P Z
u š] v (š v } CE } v š u] v š } } v Á Ÿ š ž • •
%o š Z } P v • X v D %o š Ÿ } v u š } μ o] š Ç u v P
• Ç • š u š Z] u • š } %d CE v Á Ÿ v š • • š OE v • u] ••
v %o CE } μ Ÿ } v • (u š } (CE } Z μ u u %o Ÿ } v X
μ CE] OE P μ Ÿ v } v • %o Ÿ } CE } • • • v } CE P v •
(} CE v • μ u %o Ÿ } v š } Á CE } } μ • CE v Ÿ v • v CE
} v u v š Z CE L CE } CE š } %o CE À v š š Z
CE Z] v P š Z } d Z] u } v CE X u v Ÿ } v Z } Á Á CE
} μ v š } (CE š Z] o } • • •] v μ CE CE] Á • š } l (CE μ CE
v š CE CE • X CE } • %o š μ Ÿ } Á • } v μ š] v / v š } CE } μ Ÿ } v
} μ v š Ç š } CE u] v š Z %o CE À v o] Ÿ } v • } μ •] v P
CE • • v P v } CE v u v Ÿ } v v š Z • • }] š < v Ç Z • o] À %o š } μ o } } (} v ó X ð u] o } }] X í
• v v] o } • • X Ÿ v Á • • μ CE Ÿ v] v } v P
] v • %o Ÿ CE v } CE •] v š Z %o CE] } š Á v : î X ñ CE Ç] ð ð ð ð } v š } μ o] P • v î i u] o } } v Z] l v €
u CE î î î X Á CE P v } v] o } • • Á CE < v Ç] •] v Ÿ Ç • o o } μ P Z š CE P } š • U %o]
• Ÿ u š μ •] v P v v μ o Á CE P v μ u CE } l } v X } z } l (CE } š o • U Z %o v P } š • CE %o CE
• o μ P Z š CE U š v v μ (o } CE P v v u v Ÿ } v v } (} u • Ÿ u š } v • μ u %o Ÿ } v < v Ç U Ad š Z š Z u] v
Á CE P %o CE] } (š Z v • X CE] } μ • } CE } μ CE } (CE š € Ÿ • X / v } o ð ð U š } μ v š } (CE

dZ u] š v • %o Ÿ CE } CE •] v š Z %o CE] } (š Á v š } š š o } v v • μ u } Ç < v Ç v • € i • X d
î î î ð î î î U] v } Z š Ÿ } š š o } (î î ô U ð î v] %o } μ o } v <.]] } μ v š Ç] • μ š î ô ð ð ð U z
• o μ P Z š CE } v š Z] v <.]] } μ v š Ç U (š Z U z ð ð ð X } š • U î i U ð î î • Z %o U î i U î i i CE } o
~ ð ð U ð ð î • } o } X í 9 ~ ð ð U CE î i P } š • v î X ð ð CE • v } Á CE í U v } μ i } μ o } P CE Ç € ð • X
~ í U î î ð • Á CE š Z š } o } X (î U î ð ñ Á Z } o CE • • • v } (} CE } š] v] v %o } %o
ð ð U ð ð î } CE P v • Á CE CE %o } CE š š } Z Á D v š } v • v v X } o } μ CE } (} %o CE } š] v] v %o } %o
{ (š Z î U î ð ñ } v u v Á Z } o CE • • • U î i U ð ð Á CE } Z CE } CE (v • u] • • } } v } (} • • • š }
o i U î î ð (CE } u P } š • v î ð ð Á CE • Z %o X } K (o š Z μ ð ð ð CE } %o Ÿ š μ u %o Ÿ š v v • š î ð l
} v u v } CE P v CE U o] μ v š } (CE ð i X ñ 9 Á Z] U î ð ð } μ v š Ç • Ÿ Z u š v v μ o %o CE %o] š
o μ v P • U î ð X ó 9 ~ î ð U î î • U]] v š Ç • Ÿ v v X ó 9 } v • μ u } μ } } v î X ñ IP Á Z] Z] • Á Ç v (Ÿ CE v o o
• š } u Z • ó X ó 9 Z î i U ð ð U ~ í U ð ð i • v Z CE } Á • CE P } CE ñ U } Á • X dZ u š } v • μ u } μ • š
š } v P μ • î X ó 9 ~ ð ð • X dZ u] v CE • • } (CE } CE } } μ v o] Z o š Z X %o D Ÿ } v v] u %o } CE š
} v u v Ÿ } v CE } • • š Z š Z CE • %o] • Á • š } (CE } CE } } μ v o] Z o š Z X %o D Ÿ } v v] u %o } CE š
P v CE Ÿ o } μ] v } u u Ÿ } v ñ U Ÿ } o } %o Ÿ
î X ð 9 v š o v P] š • • • ~ í X ñ 9 • X > μ v P Z Á š CE Q u CE (CE] Á] š Z u CE l š u + š š Z Á š š Z •
} v u v μ š } • • • ~ í X ñ 9 • U %o o μ CE } Ç } } v î X ñ 9 • } v] Ÿ } v ó • X v μ u CE } v] } v •
%o v μ u } v] ~ í X ñ 9 • U] v Ç • μ š } Z Ç CE } Ÿ • %o Z CE } v } v Ÿ } v } v î X ñ 9 CE • • • v } CE P v • μ
v %o Z CE } X í 9] v G u u Ÿ } v X ó 9 X • v š } v v %o Ÿ } v Z X u } š } u μ v v Ÿ } v • μ •] v P CE • •
μ š } Ç • Ÿ CE] v • ó X ó 9 Ÿ v } u Ç } } X ó 9 v } v } CE P v v u v Ÿ } v } v o μ Ç • Ÿ CE } Z P U Ÿ } •] • U
Z u } CE CE Z í P 9 X v Á Z] o ZE CE š v Á v μ } (} o } •] • U o } μ } • CE CE μ o o } •] • U v š Z CE Á E

Z u } CE CE Z P • %o CE] 9 U CE î ñ X ó U } Ç • Ÿ CE μ •
} Á P • ó X í 9 X dZ Ÿ š } š • v] o } • • CE] μ š }
CE • •] } CE P v u v Ÿ } w <.]]] } μ v š Ç } š Á v
v î i ð Á • h ^ ñ o U î i í X î i %o CE u } v š Z X
dZ] • • š μ Ç } v o μ } š Z ^ š o (} v } o } Ÿ } v } U
] v G u u š } CE Ç] Ÿ } v CE u] v š Z } u u } v μ • •
} CE P } w u v Ÿ } w } v •] CE o } v } u] o } • •
} μ v š Ç U < v Ç X
< Ç Á } CE • CE v • • V K } CE P v v Ÿ } & } v v] o o } • • •

d oíWv] vCE š(À CE]]µ•]š]]šZ š }vš(CE]]µ• P v }v µw šd]]µPZš CEZ}µ• •]v <]•]]

&RQGHPQHG RUJDQ	V &RQGLWLRQ FRQGHPQDWLRQ	QXPEHUVLQRI RUJDQ FRQGHPQHG	DHDQWDJH FRQGHPQDWLRQ
/LYHU 1	/LYHU FLUUKRVLV	GHJHQHUDWLRQ	
	,QIODPPDWLRQ		
	<i>Stilesia hepatica</i>		
	7HODQJLHFWDLV		
	/LYHU IOXNHV		
	\$EVFHV		
	+\GDWLG F\VV		
	3DUDVLWLF F\VV		
/XQJV 1	\$EVFHV		
	3OHXULV\		
	3QHXPQLD		
	(PSK\VHPD		
	&RQJHVWLRQ		
	3DUDVLWHV		
	(FKLQRFRFFRVLV		
.LGQH\V 1	+\GURQHSKURVLV		
	1HSKULWL		
	,QIODPPDWLRQ RI FDSVXOHV		
	+HPRUUKDJHV		
	,QIDUFV		
,QWHVWLQHV DQG V 1	WLPFDFKXW		
	+HPRUUKDJHV		
	(QWHULWL		
	3DUDVLWHV		
	,QIDUFV		
+HDUWV 1	+HPRUUKDJHV		
	3HULFDUGLWL		
	<i>Cysticercus bovis</i>		

	(PSK\VHPD		
	&RQJHVWLRQ		
+HDG DQG WRQJXH	&\VWLFHUFXV ERYLV		
1	\$FWLQRP\FRVLV		
	+HPRUUKDJHV		
	\$EVFHVV		

&]v v]o}•• •©œ] μ\$ }v uv Ÿ}Ÿ
œ •• •l}œP v•]v <]•]] }μvšÇ

The total estimated financial loss attributed to carcass/organ condemnation in Kisii County between 2004 and 2014 was USD 571,211.22 per month. The highest financial losses occurred in the 2006 with the least losses being observed in the year 2010. Economic losses attributed to condemnation of carcasses/organs were bovine USD 97,431.20, goats USD 92,089.40 and sheep USD 24,357.30. Losses due to condemnation of the liver were

USD 213.66 which accounted for 37.4% of the total losses in 10 years. Condemnation of lungs led to estimated loss of USD 101,211.00. Condemnation of hearts led to estimated loss of USD 101,211.00. Condemnation of kidneys led to estimated loss of USD 101,211.00. Condemnation of spleens led to estimated loss of USD 101,211.00. Condemnation of stomachs led to estimated loss of USD 101,211.00. Condemnation of intestines led to estimated loss of USD 101,211.00. Condemnation of livers led to estimated loss of USD 101,211.00. Condemnation of testicles led to estimated loss of USD 101,211.00. Condemnation of ovaries led to estimated loss of USD 101,211.00. Condemnation of uteri led to estimated loss of USD 101,211.00. Condemnation of vaginas led to estimated loss of USD 101,211.00. Condemnation of penises led to estimated loss of USD 101,211.00. Condemnation of scrotums led to estimated loss of USD 101,211.00. Condemnation of prepuces led to estimated loss of USD 101,211.00. Condemnation of clitorides led to estimated loss of USD 101,211.00. Condemnation of mammary glands led to estimated loss of USD 101,211.00. Condemnation of teats led to estimated loss of USD 101,211.00. Condemnation of udders led to estimated loss of USD 101,211.00. Condemnation of vulvas led to estimated loss of USD 101,211.00. Condemnation of vaginas led to estimated loss of USD 101,211.00. Condemnation of penises led to estimated loss of USD 101,211.00. Condemnation of scrotums led to estimated loss of USD 101,211.00. Condemnation of prepuces led to estimated loss of USD 101,211.00. Condemnation of clitorides led to estimated loss of USD 101,211.00. Condemnation of mammary glands led to estimated loss of USD 101,211.00. Condemnation of teats led to estimated loss of USD 101,211.00. Condemnation of udders led to estimated loss of USD 101,211.00. Condemnation of vulvas led to estimated loss of USD 101,211.00.

Table 2: Estimated economic loss due to condemnation attributed to specific conditions in slaughterhouses in Kisii County between 2004-2014.

Condemned organ and attributed 10-year total loss	Condition causing condemnation of an organ	(VWLPDWHG \HDU (VWLPDWHGWR \HDU OR D VSHFLILF FRQGLWDRQSH(FLILF FRQGLWLF .(6	
:KROH FDUFDVV	,QFRPSOHWH EOHHGLQJ		
.(6			
+HDG DQG WRQJXH	\$EVFHVV		
.(6	\$FWLQRP\FRVLV		
	<i>Cysticercus bovis</i>		
	&\VWLFHUFRVLV		
/LYHU	\$EVFHVV		
.(6	&LUUKRVLV		
)OXNHV		
	(FKLQRFRFFRVLV		
	,QIODPHG FDSVXOH		
	<i>Stilesia hepatica</i>		
	7HOHQJHFWDVLV		
/XQJV	\$EVFHVV		
.(6	&RQJHVWLRQ		

	Emphysema *	41,03,887.44	41038.87
	Parasites	19,81,825.32	19818.25
	Pleurisy	23,67,092.69	23670.93
	Echinococcosis	22,99,135.55	22991.36
	Pneumonia	12,66,997.25	12669.97
Stomach&intestines	Enteritis	3,58,658.60	3586.59
KES 2,132,001.48	Hemorrhages*	8,86,671.44	8866.71
	Pimpily gut*	8,86,671.44	8866.71
Kidneys	Hydronephrosis	2,90,654.04	2906.54
KES 1,573,405.78	Hemorrhages*	5,15,390.75	5153.91
	Infarcts	5,15,390.75	5153.91
	Nephritis	93,719.95	937.2
	Inflamed capsule	1,58,250.29	1582.5
Heart	Hemorrhages	2,38,301.62	2383.02
KES 7,958,866.09	<i>Cysticercus bovis</i>	1,85,157.72	1851.58
	Pericarditis	1,85,157.72	1851.58
	Empysema	1,49,138.17	1491.38
	Congestion*	72,01,110.86	72011.11

Note: * Indicate conditions that led to highest financial loss per condemned organ.

Discussion

Conditions causing carcass and organ condemnation

Condemnation of various organs in the study area was attributed to different conditions. Whole carcass condemnation was mainly due to improper bleeding, this finding was partly in agreement with a study by Yesihak and Webb [10] who found the main causes of partial condemnation of carcasses to be bruising (34.11%), poor bleeding (25.59%) contamination (12.58%) and adhesion (9.37%). On the other hand, condemnations of specific organs in this study were found to be due to various causes. Liver condemnation was found to be mainly due to fascioliasis, liver degeneration, inflammatory conditions, *Stilesia hepatica* and hydronephrosis. The leading cause of condemnation of lungs was inflammatory conditions including pleurisy and pneumonia (37.6%) and abscesses (32.5%). These causes of organ condemnation were similar to various findings found in Ethiopia where *Stilesia hepatica*, pneumonia, pericarditis and nephritis were found to be the main causes for goat and sheep organs condemnation in

Bishoftu Elfora export abattoir [18]. However, they differed with finding of a study by Yesihika and Webb who found the main causes of condemnations of livers to be fasciola (29.74%), and lungs to be due to hydatid cysts (23.01%) and pneumonia (22.68%) [10].

The findings in this study were also not in agreement with a study done by Alembrian and Haylegebriel [19] in Ethiopia who found hydatidosis to be the leading cause of lung condemnations in slaughter house in northern Ethiopia. 37.6% of lung condemnation was attributed to inflammatory conditions which were much lower than that documented at 60%. In another study in southern Ethiopia, which differed slightly with the findings in Kisii County, the major causes of condemnation in cattle carcasses were fascioliasis, hydatidosis, emphysema and pericarditis [18]. A study by Tembo and Nonga [20] in Dodoma, Tanzania documented hydatidosis, cysticercosis, fascioliasis and tuberculosis as major causes of organ condemnation. A study in Kisumu, Kenya between 2003 and 2008 found out that livers and lungs were condemned mainly due to parasitic conditions including fascioliasis, cysticercosis, cystic echinococcosis, *Stilesia hepatica* [9]. The

