

## Identifying and Evaluation of the Main Reasons for Condemnation of Organs and Carcasses of Slaughtered Animals in a Selected Abattoir

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### Abstract

The major challenges in the slaughter of animals are the need to identify, understand, and develop effective methods and controls against the total losses plaguing Egyptian animal wealth. During three years of study, a total of 8028 slaughtered animals, of which 3587, 3462, 439, and 540 were cows, buffaloes, sheep, and goats, respectively, were slaughtered at the Al-Arish abattoir. The total numbers of organs and carcasses condemned were 248, 212, 212,150, and 105 of cows, buffaloes, sheep, and goats, respectively. The most affected organs in slaughtered cows, buffaloes, sheep, and goats were the lung with 72 (29.0%), 80 (37.7%), 55 (36.7%), and 50 (47.6%); the liver with 30 (12.1%), 40 (18.9%), 50 (33.3%), and 10 (9.5%), respectively; and the esophagus with 30 (12.1%), 30 (14.2%), 20 (13.3%), and 20 (19.1%), respectively. Meanwhile, carcasses with ill bleeding and/or emaciation were 10 (4.0%), 13 (6.1%), 10 (6.7%), and 10 (9.5%), respectively. The major cause of condemnation in all slaughtered animals was pneumonia, with 65 (26.2%), 60 (28.30%), 40 (26.7%), and 40 (38.1%), respectively. Abscess was detected in 20 (8.06%), 30 (14.15%), 30 (20.0%), and 10 (9.5%), respectively. Meanwhile, Sarcocystis occurs with 10 (4.03%), 30 (14.15%), 20 (13.3%), and 20 (19.1%), respectively. Other causes of condemnation in some animal species and not others were liver cirrhosis in cows, buffaloes, and sheep (4.3%, 14.15%, and 13.3%); TB in cows and buffaloes (8.87% and 1.89%); caseous lymphadenitis in sheep and goats; hydatid cysts in sheep and goats; cysticercus bovis in cows; emaciation; ill bleeding; brucella; and jaundice, which were detected with various percentages. The economic losses reached 3781401 LE in cows, 2643160 LE in buffaloes, 60830 / LE in sheep and 94200 / LE in goats with total economic loss reaching 6579591/LE.

**Key words:** Carcass, Organs condemnation, PM lesion, Economic loss.

## Introduction

The goal of the abattoir is to ensure healthy and wholesome of the meat from the public health prospective and in controlling animal diseases (*Antic et al.2021*). One of the major challenges in meat hygiene sector is the need to identify an effective methods and controls against the total losses and its dangers to consumer health resulting from diseases conditions (*Siluma et al., 2023*). However, there are constraints that hindered the potential of livestock production include traditional management system, limited genetic potential, lack of appropriate disease control policy and veterinary services. Due to these and complicated factors, each year a lot of significant economic losses result from condemnation of edible organs and carcass (*Amene et al.,2012, Genet et al., 2012, and Hamouda et al.,2025*). It is known that, one method of determining the disease conditions of cattle is through monitoring the diseases and other conditions at the abattoir. (*Mellau et al., 2010*). The abattoirs played an important role in screening the diseases and abnormalities that are not acceptable or safe for human consumption (*Alton et al., 2010 ; Antic et al., 2021*). Significant parasitic diseases, including Fasciolosis, Sarcocystis and Cysticercosis, were responsible for

organs and carcasses condemnation and lead to considerable economic losses. (*Allam et al., 2022; Borji and arandeh, 2012*). The main cause of organs condemnation during postmortem inspection are diseases condition caused by bacteria, parasites, viruses, slaughtering faults and managements of living animals before slaughtering (*Gent et al., 2012; Berbersa et al 2016*). The condemnation of organs and carcasses during postmortem inspection not only plays a crucial role in ensuring food safety but also has significant economic importance for meat industry (*Ciui et al 2023*). In a recent study at Faraskur abattoir (*Hamouda et al., 2025*) recorded 157 condemned cases in cows and the most affected organs were the liver and lungs, with a total prevalence of affection of 7.0% and 46.0%, respectively. While in buffaloes, 140 condemned cases and the highest lesions were in the liver and lung, with total prevalence affection of 22.14% and 54.29%, respectively. In sheep, 87 condemned cases were recorded with a total prevalence of 27.58% and 41.39% in the liver and lung, respectively. This current study was done to throw a light on the rate and prevalence of organs and carcasses condemnation in Al Arish abattoir, North Sinai Governorate to highlight the prevalence and major

cause of condemnation of slaughtered animals and serving as an indicator of field disease condition in order to properly manage the inspection of animals to prevent unsafe meat from reaching consumers, to reduce the economic loss, and to inform those responsible for animal welfare to take the necessary measures regarding the necessary treatments or specializations to combat diseases.

### Materials and Methods

A total number of 3587 cows, 3462 buffaloes, 439 sheep and 540 goats were slaughtered at Al-Arish abattoir during the period 2021 to 2023, to study the major causes of organs and carcasses condemnation of slaughtered animals and estimate the financial loss due to condemnations of organs and carcasses. According to the Egyptian and International legislations of routine postmortem inspection, the methods recommended by *Egyptian Law (EOS 517:1986)* and *Gracey's Meat Hygiene (2015)* was applied during post-mortem inspection;

### Prevalence calculation:

The prevalence of diseases/conditions was annually calculated as percentages of the organs condemned during the same period. The overall prevalence for the three years (2021–2023) was also determined. Data obtained were entered, validated and calculated in Microsoft Excel 2007

spreadsheet and the proportions (%) of lesions were calculated considering the number of condemned carcasses or organs due to a specific cause, against the total number condemned.

### Calculation of economic loss:

Calculation of the economic loss was calculated by weighing of condemned organs by digital balance and multiplies it by current price in market, Economic losses = weight of condemned organ × current price per EGP.

### Results and Discussion

The results given in **Table (1)** revealed that, 3587 cows were slaughtered at Al Arish abattoir (1402-1305-880), 3462 of slaughtered buffaloes (1355-1317-790), 439 of slaughtered sheep (113-192-134), 540 of slaughtered goat (178-291-71), the result obtained during the studied periods were higher than that recorded by *El-Sharawy (2018)* in Al Arish province.

The results given in **Table (2,6&7)** revealed that, abnormal conditions which detected in cows organs and required condemnation were : 30 liver cases in which 20 (8.1%) affected by various size abscess formation, and 10(4.0%) with liver cirrhosis due to parasitic infestation with total liver affection of 12.1%%, while 72 lung lesions revealed many abnormal condition including pneumonia with 65 (26.2%), localized TB with 2 (0.8%), and emphysema

with 5 (2.0%), also 20 (8.1%) head affected by localized TB, 31 spleen was affected by splenomegaly 6 (2.4%), hemorrhages 25 (10.1%), in addition 20 (8.1%) tongue and 35 (14.1%) heart were affected with *Cysticercus bovis* cysts; ill bleeding 3 (1.2%), emaciation 7 (2.8%), esophagus with sarcocystis with 30 (12.1%), the results revealed that, parasitic infestation were lower than those reported by *Cadmus and Adesokan (2009)*, *Sheferaw et al. (2009)* and *Fekadu et al. (2012)* while liver abscess recorded was higher than those reported by *Tilahun et al. (2017)* and *Seid et al. (2019)* while lower than *Mohamd (2021)*, and *Shiferaw et al. (2009)*. The gross pathological finding in Lung pneumonia was higher than those reported by *Adamou et al., (2023)*, *Jaja et al. (2016)*, *Mummed and Webb (2015)*, *Edo et al. (2014)*, and *Hamouda et al. (2025)* but lower than those reported by *Tilahun et al. (2017)*. Meanwhile lung emphysema was lower than those reported by *Tilahun et al. (2017)*, and *Tembo and Nonga (2015)* while higher than those reported by *Tesfaye et al. (2017)*, *Jaja et al., (2016)* and *Edo et al. (2014)*. The results of gross postmortem finding showed that, the total affections of spleen was lower than those reported by *Sheferaw and Abdu (2017)*, while the results of *Cysticercus bovis* observed in tongue was lower than those recorded by *Madzingira et al.*

(2018), and the cysts recorded in heart was higher than those detected by *Edo et al. (2014)*. The total carcass condemnation due to ill bleeding was higher than those recorded by *Mummed and Webb (2015)*.

The results given in **Table (3, 6 and 7)** revealed that, the total abnormal gross postmortem lesions of carcasses and organs in slaughtered buffaloes were 212 cases in which 40 liver were observed with abnormal lesions; 10 (4.7%) abscess with 30 (14.2%) and cirrhosis 14 (15.1%) with total organs affection with 18.9%, while the total lung affections was 80 (37.7%) in which pneumonia with 60 (28.3%), while abscess cases was 20 (9.4%), Head lesions was recorded by 4 cases with localized TB with (1.8%), 13 (6.1%) carcass case were condemned due to ill bleeding 3 (1.4% and 1.4%), odema 10 (4.7%), while in fat jaundice was detected with 10 (4.7%), and in brucella 5 (2.4%). Meanwhile 30 (14.2%) esophagus cases were affected by sarcocystis, 30 (14.2%) case kidneys were affected by hydronephrosis. The obtained results for gross postmortem buffaloes affection were 212 cases, liver abscess affection was lower than *Mohamd (2021)* and *Madzingira et al. (2018)* but higher than those reported by *Tilahun et al. (2017)* and *Denbarga et al. (2011)*, while liver cirrhosis (Fasciolasis) was lower than those reported by *Efrem et al. (2015)*

and *Assefa and Tesfay (2013)* but higher than those reported by *Edo et al. (2014)*, *Denbarga et al. (2011)*, and *Hamouda et al. (2025)*. Lung pneumonia was higher than those reported by *Cadmus and Adesokan (2009)*, *Edo et al. (2014)* and *Denbarga et al. (2011)*, and *Hamouda et al. (2025)*, while lung abscess in this study was higher than *Denbarga et al. (2011)* and *Edo et al. (2014)* but lower than *Madzingira et al. (2018)*, esophagus sarcocystis was lower than those reported by *El-Sharawy (2018)*. While total carcass condemnation due to jaundice was higher than *Mohammed et al. (2018)* and *Hamouda et al.,(2025)*.

The results given in **table (4,6, and 7)** revealed that, the abnormal gross postmortem lesions of carcasses and organs of slaughtered sheep were 150 cases: in which 50 liver were observed with abnormal lesions ; abscess 30 (20%) , cirrhosis 20 (13.334%) , while 55(36.7%) lung affected by pneumonia 40(26.7%) and hydatid cyst 15(10%),20 esophagus were affected by Sarcocystis 20(13.333%),10(6.7) carcasses were affected by emaciation, while15(10%)caseous lymphadenitis. The results obtained in this study for gross postmortem in sheep affection were 150 cases, the result of liver cirrhosis was higher than *Allam (2022)* and *Dejene et al. (2013)* while lung pneumonia was lower than *Mellau*

*et al.,(2010)* ,hydatid cyst was higher than *Allam (2022)* ,total carcasses condemnation was higher than *Dejene et al.,(2013)*, esophagus sarcocystis in this study was higher than those reported by *El-sharawy(2018)*.

The results given in **Table (5,6& 7)** revealed that the total abnormal gross postmortem conditions of carcasses and organs of slaughtered goats were 105 cases: in which 10 (9.5%)liver were observed with abnormal lesions ; abscess 10 (9.5%) , while 50(47.6%) lung affected by pneumonia 40(38.02%), hydatid cysts 10(9.5%) ,15(14.3%) carcass L.N caseous lymphadenitis, 20(19%) esophagus affected sarcocystis,10 (9.5%)carcasses affected by emaciation, so from previous results total sheep affection were (105),from the previous results we found that, the Lung pneumonia was lower than those reported by *Mellau et al.,(2010)*, sarcocystis was lower than goat sarcocystis affection reported by *El-sharawy(2018)*.

The results given in **Tables (8&9)** revealed that, the overall economic loss due to organs and carcasses condemnation of slaughtered cows, buffaloes, sheep and goat were 3781401, 2643160 (6424561/LE), 60830, 94200 (155030/LE) with total economic loss equal to 6579591 /LE during three years' study.

**Table (1):** Number of the slaughtered animals at Al-Arish abattoir from 2021 to 2023

Year	Slaughtered animals			
	Cows	Buffaloes	Sheep	Goat
2021	1402	1355	113	178
2022	1305	1317	192	291
2023	880	790	134	71
	3587	3462	439	540

**Table (2)** Prevalence of condemnation cause in slaughtered cows (2021 to 2023)

Organ	Cause of condemnation	No	%
liver	Abscess	20	8.1
	Cirrhosis	10	4.0
Lung	Pneumonia	65	26.2
	Tuberculosis	2	0.8
	Emphysema	5	2.0
Head	Tuberculosis	20	8.1
Spleen	Splenomegaly	6	2.4
	Haemorrhages	25	10.1
Tongue	Cysticercus bovis	20	8.1
Heart	Cysticercus bovis	35	14.1
Esophagus	Sarcocystis	30	12.1
carcass	Ill bleeding	3	1.2
	Emaciation	7	2.8
Total		248	100.0

**Table (3)** Prevalence of condemnation cause and organs in Slaughtered Buffaloes

Organ	Cause of condemnation	N0	%
liver	Abscess	10	4.7
	Cirrhosis	30	14.2
Lung	Pneumonia	60	28.3
	Abscess	20	9.4
Head	Tuberculosis	4	1.8
Carcasses	Ill Bleeding	3	1.4
	Odema	10	4.7
Fat	Jaundice	10	4.7
L.N	Brucella	5	2.4
Esophagus	Sarcocystis	30	14.2
kidneys	Hydronephrosis	30	14.2
Total		212	100.0

**Table (4):** *Prevalence of condemnation cause in slaughtered sheep*

Organ	Cause of condemnation	No	%
liver	Cirrhosis	20	13.3
	Abscesses	30	20.0
Lung	Pneumonia	40	26.7
	Hydatid cysts	15	10.0
Esophagus	Sarcocystis	20	13.3
Carcass	Emaciation	10	6.7
Carcass L.N	Caseous lymphadenitis	15	10.0
<b>Total</b>		<b>150</b>	<b>100.0</b>

**Table (5):** *Prevalence of condemnation cause and organs in slaughtered Goats*

Organ	Cause of condemnation	No	%
liver	Abscess	10	9.5
Lung	Pneumonia	40	38.2
	Hydatid cysts	10	9.5
L.N	C. lymphadenitis	15	14.3
Esophagus	Sarcocystis	20	19.0
Carcass	Emaciation	10	9.5
<b>Total cause of condemnation</b>		<b>105</b>	<b>100%</b>

**Table (6):** *Prevalence of condemnation in slaughtered animals*

Organ	Cows		Buffaloes		Sheep		Goats	
	No	%	No	%	No	%	No	%
lung	72	29.0	80	37.7	55	36.7	50	47.6
liver	30	12.1	40	18.9	50	33.3	10	9.5
Esophagus	30	12.1	30	14.1	20	13.3	20	19.1
carcass	10	4.0	13	6.1	10	6.7	10	9.5
L.N	-	-	5	2.6	15	10.0	15	14.3
head	20	8.1	4	1.8	-	-	-	-
spleen	31	12.5	-	-	-	-	-	-
kidneys	-	-	30	14.1	-	-	-	-
Heart	35	14.1	-	-	-	-	-	-
Tongue	20	8.1	-	-	-	-	-	-
Fat	-	-	10	4.6	-	-	-	-
<b>Total</b>	<b>248</b>	<b>100.0</b>	<b>212</b>	<b>100.0</b>	<b>150</b>	<b>100.0</b>	<b>105</b>	<b>100.0</b>

**Table (7):** Prevalence of the major cause of condemnation of slaughtered animals

Disease condition	Cows		Buffaloes		Sheep		Goat	
	No	%	N0	%	N0	%	N0	%
Pneumonia	65	26.22	60	28.30	40	26.7	40	38.1
Abscess	20	8.06	30	14.15	30	20.0	10	9.5
Sarcocystis	30	12.09	30	14.15	20	13.3	20	19.1
Liver Cirrhosis	10	4.03	30	14.15	20	13.3	-	-
Tuberculosis	22	8.87	4	1.89	-	-	-	-
C. lymphadenitis	-	-	-	-	25	16.7	15	14.3
Hydatid cysts	-	-	-	-	15	10.0	10	9.5
Cysticercus bovis	55	22.18	-	-	-	-	-	-
Hemorrhages	25	10.08	-	-	-	-	-	-
Emaciations	7	2.82	-	-	-	-	10	9.5
Splenomegaly	6	2.41	-	-	-	-	-	-
Emphysema	5	2.03	-	-	-	-	-	-
Ill bleeding	3	1.21	3	1.41	-	-	-	-
Brucella	-	-	5	2.36	-	-	-	-
Hydronephrosis	-	-	30	14.15	-	-	-	-
Odema	-	-	10	4.71	-	-	-	-
Jaundice	-	-	10	4.71	-	-	-	-
Total	248	100.0	212	100.0	150	100.0	105	100.0

**Table (8):** Economic loss of carcass and organs condemnation in Slaughtered cows and Buffaloes at Al-Arish abattoir from 2021 to 2023

Organ	Cows			Buffaloes		
	N0	W/kg	P/LE	N0	W/kg*	P/LE*
liver	30	150	34500	40	200	46000
Lung	72	216	2376	80	240	7920
Head	20	140	18200	4	28	3640
Spleen	31	155	13175	-	-	-
Tongue	20	80	10400	-	-	-
Heart	35	175	22750			
Esophagus	-	-	-	30	60	2400
Kidneys	-	-	-	30	120	7200
Carcasses**	40	16000	3680000	28	11200	2576000
loss		3781401 /LE		2643160 LE		
Total loss		6424561/ LE				

\*Estimated weight of cow liver: 5Kg

\*Estimated weight of cow lung: 3 Kg

\*Estimated price of cow liver: average 230 L.E

\* Estimated price of cow lung: average 33 L.E

\*\* Parietal and total condemnation



**Table (9):** *Economic loss of carcass and organs condemnation in Slaughtered Sheep and Goats at Al-Arish abattoir from 2021 to 2023*

Organ	Sheep			Goat		
	N0	W/kg	P/LE	N0	W/kg*	P/LE*
liver	50	75	18750	10	15	3750
Lung	55	110	4180	50	100	3800
Shoulder	20	20	400	15	45	11250
Esophagus	25	750	18750	20	20	400
Carcasses**	50	75	18750	10	300	75000
loss		60830 / LE		94200 / LE		
Total loss		155030/ LE				

\*Estimated weight of sheep and Goats liver: 1.5Kg

\*Estimated weight of sheep and Goats lung:2kg

\* Estimated average price of sheep and Goats liver: 250 L.E

\* Estimated average price of sheep and Goats lung: 38 L.E

\*\* Parietal and total condemnation

## Conclusion

The major challenges in the slaughter animals are the need to identify, understand, develop effective methods, and controls against the total losses plaguing Egyptian animal wealth and economic losses. The most affected organs in slaughtered animals in this study were the lung, liver, heart, and Esophagus. The major causes of condemnation in all slaughtered animals were pneumonia, abscess, and parasitic infestation. Other causes of condemnation in some animal species and not another were liver cirrhosis in cows, buffaloes and sheep, TB in cows and buffaloes, caseous lymphadenitis in sheep and goats, Hydatid cysts in sheep and goats, cysticercus bovis in cow, emaciation, ill bleeding, brucella, and jaundice were detected with various percentages. Therefore,

improving animal welfare, increase veterinary services and Educating breeders and farmers about bacterial, viral, and parasites diseases, and how to avoid infection can reduce the economic losses.

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## الملخص العربي

### تحديد وتقييم الأسباب الرئيسية لإعدام الأعضاء وذبائح الحيوانات في مسلخ مختار

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تتمثل التحديات الرئيسية في مجال ذبح الحيوانات في تحديد وفهم وتطوير أساليب فعالة وضوابط للحد من الخسائر الإجمالية التي تُعاني منها الثروة الحيوانية المصرية. ومن خلال ثلاث سنوات من الدراسة، بلغ إجمالي عدد الحيوانات المذبوحة 8028 حيواناً، منها 3587 و 3462 و 439 و 540 رأساً من الأبقار والجاموس والأغنام والماعز على التوالي، قد ذبحت في مسلخ العريش. وبلغ إجمالي عدد الأعضاء والذبائح المُعدمة 248 و 212 و 150 متمثلة في الأعضاء والذبائح اماكليا اوجزئيا من الأبقار والجاموس والأغنام والماعز على التوالي وكانت أكثر الأعضاء تأثراً في الأبقار والجاموس والأغنام والماعز المذبوحة هي الرئة بنسبة 72 (29.0%)، و 80 (37.7%)، و 55 (36.7%)، و 50 (47.6%)، والكبد بنسبة 30 (12.1%)، و 40 (18.9%)، و 50 (33.3%)، و 10 (9.5%) على التوالي، والمرء بنسبة 30 (12.1%)، و 30 (14.2%)، و 20 (13.3%)، و 20 (19.1%) على التوالي. في المقابل، كانت الذبائح التي تعاني من نزيف حاد و/أو هزال بنسبة 10 (4.0%)، و 13 (6.1%)، و 10 (6.7%)، و 10 (9.5%) على التوالي. كان الالتهاب الرئوي السبب الرئيسي للوفاة في جميع الحيوانات المذبوحة، حيث بلغت نسبته 65 (26.2%)، و 60 (28.30%)، و 40 (26.7%)، و 40 (38.1%) على التوالي. كما اكتُشف وجود خراج في 20 (8.06%)، و 30 (14.15%)، و 30 (20.0%)، و 10 (9.5%) على التوالي. في المقابل، اكتُشفت حالة الإصابة بالساركوسيس في 10 (4.03%)، و 30 (14.15%)، و 20 (13.3%)، و 20 (19.1%) على التوالي. ومن الأسباب الأخرى للإعدامات في بعض أنواع الحيوانات دون غيرها مثل تليف الكبد في الأبقار والجاموس والأغنام (4.3%)، و 14.15% (13.3%)، والسل في الأبقار والجاموس (8.87% و 1.89%)، والتهاب الغدد الليمفاوية التجبني في الأغنام والماعز، و الهائيدات في الأغنام والماعز، وداء الكيسات البقرية في الأبقار، والهزال، والنزيف المرضي، والبروسيلة، والبرقان، وقد وجدت بنسب متفاوتة. وبلغت الخسائر الاقتصادية 3781401 جنيه مصري في الأبقار و 2643160 جنيه مصري في الجاموس، و 60830 جنيه مصري في الأغنام و 94200 جنيه مصري في الماعز، بإجمالي خسارة اقتصادية بلغت 6579591 جنيه مصري.