



BEEF CATTLE INSTITUTE
KANSAS STATE UNIVERSITY

HARVEST AUDIT PROGRAM™

SLAUGHTER DATA COLLECTION

STANDARD OPERATING PROCEDURES

BCI SOP: # 001

I. Training

- a. All BCI personnel collecting data must be trained according to the standard operating procedures herein as well as any and all other supplementary training materials prior to collecting data for an official experiment.
- b. For each organized experiment, a Training Acknowledgment Form must be signed and filed by all personnel taking part in data collection procedures. It is the responsibility of the study investigator / co-investigator to insure proper training of all personnel.

II. Communication, Planning, and General Conduct

- a. An open line of communication must be established among the cooperating feedyard from which cattle will be shipped, packing plant personnel, and BCI data collection Team Leader (TL) to assure information sharing on cattle shipping schedules and when cattle are expected to be killed.
 - i. Communication items to be determined:
 1. Date and time of harvest
 2. Identification of cattle/lot/pen
 3. Number of cattle
 4. BCI Contact
 - ii. Feedyard personnel may include general manager, cattle manager, and shipping manager
 - iii. Packing plant personnel may include plant manager, slaughter manager/supervisor, and procurement personnel
 1. Note: Tyson requires written approval from the corporate office to gain access to the plant. This request must be turned in 7 to 14 days prior to the date of entrance. All requests are to be made through Paula Bates (paula.bates@tyson.com).
- b. Travel requests must be filled out and turned into the proper KSU CVM business office personnel 7 to 14 days prior to travel. Out of state travel may require additional forms.



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Travel requests billed to Grant accounts are processed through the Clinical Science business office (Contact: Su Liu). Requests billed to restricted fees are processed through the Dean's business office (Contact: Susan Ekstrum).

- c. Reimbursement forms should be completed and filed within 5 days of return from travel.
- d. On the day of slaughter data collection, crew should be on site minimum of 1 hour prior to expected kill time of cattle. The TL should immediately make contact with a kill floor supervisor/superintendent or scale house operator to obtain an official plant line up in order to determine the plant carcass number at which target cattle begin and end. This information should be dispersed to all crew members.
- e. In general, all crew members should be in place at their respective stations at a minimum of 15 minutes or about 50 carcasses prior to the beginning of target cattle, respective to their location on the processing line.
- f. Crew members must be respectful of the working space of all plant personnel. It is vital that our observations do not impair the normal and efficient processes of the plant. **Above all, observe all personal and food safety regulations mandated by the USDA and plant personnel. Adhere to all posted signage regarding personal hygiene, personal safety and food safety. If any uncertainties arise consult the team leader and/or a plant supervisor or superintendent (Blue or Yellow hard-hat).**
 - i. **It is BCI policy to wear a hair net, hard hat, ear plugs, steel-toed rubber boots, and a clean frock at all times on the kill floor. If near areas where lactic acid is being utilized, safety glasses are also required and always strongly recommended regardless of plant policy.**

III. Harvest Data Collection

a. Start Up

- i. The TL, quality control officer (**QC**), or crew member will be stationed near the knock box to identify the beginning of the target cattle and proceed with the carcass through the plant to ensure crew members properly identify the beginning of the target cattle.

ii.

b. Rumen

i. Rumen Identification

1. Individual identification of each rumen is accomplished by marking the weasand clamps attached to the esophagus of each animal with the individual carcass number assigned to the carcass by the plant. The weasand clamp is attached "upstream" on the chain from the actual rumen data collection point.



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2. The crew member assigned to rumen data collection should arrive as early as possible to their station and communicate plans with the “weasand rodders” to allow for smooth operation. If possible, pre-number all weasand clamps with the projected carcass numbers of the target cattle
 - a. It is advantageous to begin the numbering 15-20 carcasses prior to the beginning of target cattle to assure that the hand off of marked clamps to the rodders is accomplished in an efficient and accurate manor.
 - b. It is usually sufficient to only mark the clamps with the final 3 digits of the carcass number
 3. The crew member will hand off individual marked clamps to the rodders and ensure that the number on the clamp corresponds with the carcass number to which it is applied.
 4. If a clamp is dropped or mistake is made a blank clamp should be used. If a numbered clamp is placed on the wrong carcass, a note should be made and the proper sequence regained.
 - a. Make sure to communicate this to weasand rodders.
- ii. Rumen Grading
1. Rumen grading is done by a two person crew. One reads and records the weasand number, and if possible communicates the number to the second person on the crew, who scores the rumen.
 2. One crew member will be stationed at the point on the processing line prior to the removal of the esophagus from the rumen and prior to the rumen grading crew member to identify the numbered weasand clamps and confirm the number with the grader either verbally or by recording the number on the a blank sequence sheet. This will be determined by plant design.
 - a. Crew members should note that some rumens will be condemned and therefore will never make it to this point in the processing line.
 3. The crew member charged with grading the rumen is stationed on the processing line after the rumen is opened and the paunch is drained; however, specific location may be variable according to plant design.
 - a. If verifying the carcass number verbally with the crew member reading clamps, the grader will record the number dictated to them and assign a grade according to the scoring system.



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present, the crew member will record the plant carcass number of the carcass and assign a bruise score according to the following system:

- a. Location of the bruise on the carcass is coded by assigning a number (1-9) associated with a grid overlaid on a bilateral cartoon of a beef carcass. Following assignment of bruise location, each bruise is then assigned a severity based on size. Bruises less than 2" in diameter were assigned a mild severity denoted as "-", bruises from 2-6" in diameter were assigned a moderate severity denoted as "o", and a severe grade, denoted as a "+", was defined as a bruise encompassing an area on the carcass of greater than 6" in diameter.
- b. Photographic examples of bruising scores and score sheet examples may be viewed in Appendix 2.

iv. Lung Scoring

1. One crew member will be stationed at a point on the processing line to observe lungs for the presence and severity of bovine respiratory disease (BRD) associated lung lesions. Depending on plant design and regulations, this position may be on the walkway running parallel to the offal table or ground level next near USDA inspection line. The crew member will identify the carcass number and then assign a lung score according to the following scoring system:
 - a. 0 (Normal): No visible evidence of BRD pathology. All lung tissue appears healthy.
 - b. 1 (Mild): BRD associated lesions are present and consolidated in less than 50% of any single lung lobe.
 - c. 2 (Severe): BRD associated lesions are present and consolidated in greater than 50% of any single lung lobe OR any sign of pleural adhesions (could include missing lung tissue adhered to body wall).
 - d. 3(Skip): Lungs were not visualized or carcass number identification was not made or incorrect.
2. Photographic examples of lung scores and score sheet examples may be viewed in Appendix 3.

v. Liver Scoring

1. A crew member will be stationed on the offal table to assess the presence of liver abnormalities. This location is typically near re USDA inspection



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line. The crew member will assess abnormalities according to the following scoring system:

- a. 0 (Skip) : Proper identification or visualization of liver is not possible.
 - b. 1 (Normal): Liver possesses no visual presence of abnormalities
 - c. 2 (A-): ≤ 2 abscesses, ≤ 4 cm in diameter, or resolved abscess scars
 - d. 3(A): 2-4 small abscesses 2-4cm in diameter
 - e. 4 (A+) ≥ 1 abscess > 4 cm in diameter or > 4 abscesses 2 cm in diameter
 - f. 5 (A+A) Abscess(es) adhered to body wall or GI tract
 - g. 6 (A+O) Open abscess
 - h. 7 (A+OA) Open abscess w/ adhesions.
 - i. For some studies 5,6, &7 scores may be consolidated as 4's (A+)
 - i. 8 (T) Visual gross pathological evidence of telangiectasia
 - j. 9 (C) Visual gross pathological evidence of cirrhosis
 - k. 10 (F) Visual gross pathological evidence of liver flukes or other parasites. Often, dark blue or black sections are apparent on the surface that may resemble discolored cracks in the hepatic tissue. Signs of fluke residing in the bile duct.
 - i. Communicate with USDA inspection personnel and ask them to identify livers with flukes (they may refer to them as Distoma) or other parasites since signs may be slight or hard to see without inspecting the lumen of the bile duct.
 - l. 11 (X) Miscellaneous or Contamination. Livers may be condemned that display no signs of the above gross pathological diagnoses. Fecal matter, ingesta, hair or dirt on the liver.
2. If more than one abnormality is present, mark all that apply except in case of abscess where the most severe should be marked.
 3. Photographic examples of liver abnormalities and score sheets may be viewed in Appendix 4.

IV. Quality control

- a. If labor availability allows a designated QC officer should traverse the processing line assuring that crew members are recording the proper carcass number for their respective scores or act as relief in case a restroom break is needed.



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- i. Within any single day's data collection, a change in a crew member responsibility should be noted on the respective data sheet.
 - b. If designation of a QC officer is not plausible, care must be taken to assure the proper sequence is kept by crew members recording pathology data or assigning the numbered weasand clamps. **IT IS ALWAYS BETTER TO RECORD A "SKIP" AND INSURE THAT YOU ARE RECORDING A DATA POINT FOR THE PROPER CARCASS THAN ASIGN A DATA POINT TO THE WRONG CARCASS.**
- V. Data recording, handling and storage
 - a. Plant data recording
 - i. Clip boards will be loaded prior to arriving at the plant with enough data sheets to accommodate the day's target cattle.
 - ii. Prior to recording data on sheets, crew members must date, initial, and record the location of the plant in the provided area on the data sheets.
 - iii. Crew members should assure that they have extra pens/Sharpie markers before beginning the day's data collection.
 - iv. The crew member charged with marking weasand clamps will use Sharpie Industrial Super Permanent Ink Fine Point markers.
 - v. All others may use black or blue ink pens or Sharpie markers.
 - vi. Upon completion of the days data collection, sheets shall be removed from clipboards, organized and filed in the portable file-box according to subject
 - b. Electronic data transcription
 - i. Upon returning to the office, data should be transcribed to an electronic format (EXCEL Spreadsheet) ASAP and not more than 10 days after return.
 - ii. Data transcription may be accomplished by one person or by a two person team.
 1. A two person team consists of one person who dictates data from data sheets and one person who records the dictation electronically on the Excel Spreadsheet.
 - iii. Each lesion category for a day's data collection shall be recorded on a separate tab in the same workbook. Each data line (row) shall include the plant carcass number, the kill date, and the respective lesion score.
 - iv. Raw electronic files shall be sent to the TL, Investigator, or Co-Investigator as soon as they are transcribed.
 1. A minimum of 3 separate copies of the raw electronic data files shall be made. These include but are not limited to:
 - a. Computer hard drive of the TL, Investigator, or Co-Investigator
 - b. External hard drive of the TL, Investigator, or Co-Investigator



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- c. A cloud-based system or network drive (Dropbox, Vet Med Drives, etc)
 - d. Flash Drives
 - e. Email server
 2. After electronic transcription, hard copies of the data shall be filed in a cabinet within a section designated to the respective study and organized by lesion category and collection date.
- VI. Equipment for Harvest Data Collection
 - a. It is the responsibility of the TL to assure that all equipment necessary for data collection is obtained and packed for data collection trips.
 - b. Personal Protective Equipment
 - i. Hard Hats
 - ii. Hair Nets
 - iii. Beard Nets
 - iv. Steel Toed Rubber Boots
 - v. Clean Frocks
 - vi. Ear Plugs
 - vii. Safety Glasses
 - viii. Latex Exam Gloves
 - ix. Palpation Sleeves
 - c. Data Collection
 - i. Data sheets
 - ii. Clipboards
 - iii. Pens
 - iv. Sharpie Markers
 1. Regular
 2. Industrial
 - v. Portable File Box
 - d. Miscellaneous
 - i. Trash bags
 1. For dirty frocks
 - ii. Laundry Soap
 1. If conducting a multi-day collection trip where frocks must be washed for use the next day.
 - iii. Bleach



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1. If conducting a multi-day collection trip where frocks must be washed for use the next day.
- iv. PVC bibs / coat
1. The crew member reading weasand clamps may wish to use these.



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Appendix 1.

a. "0" (Normal) All surfaces of the rumen appear healthy with long and thick papillae. No lesions, scars, or areas of sparse, short, or denuded papillae are visible.



b. "Mild": A consolidated area of sparse, short, or denuded papillae is present.





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C. "Severe" Focal or multifocal lesions or scars.

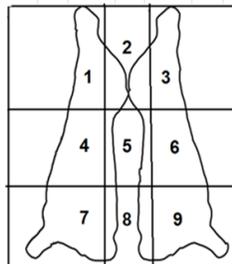




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Appendix 2.

Harvest Audit Program - Kansas State University									
Bruising Evaluation									
(B-) < 2 inches									
(B0) < 2-6 inches									
(B+) > 6 inches									
Date:									
Location:									
Initials:									
Seq. #:									
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9
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	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9
	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8	<input type="checkbox"/> 9



6⁰; A bruise occurring in zone 6 of moderate severity.

Note that this bruise has occurred in close proximity to the line between zone 3 and 6 and might be labeled as a zone 3 by some observers. The key here is consistency. If bruises are occurring in the same place, be sure to record make observations in a consistent manor.



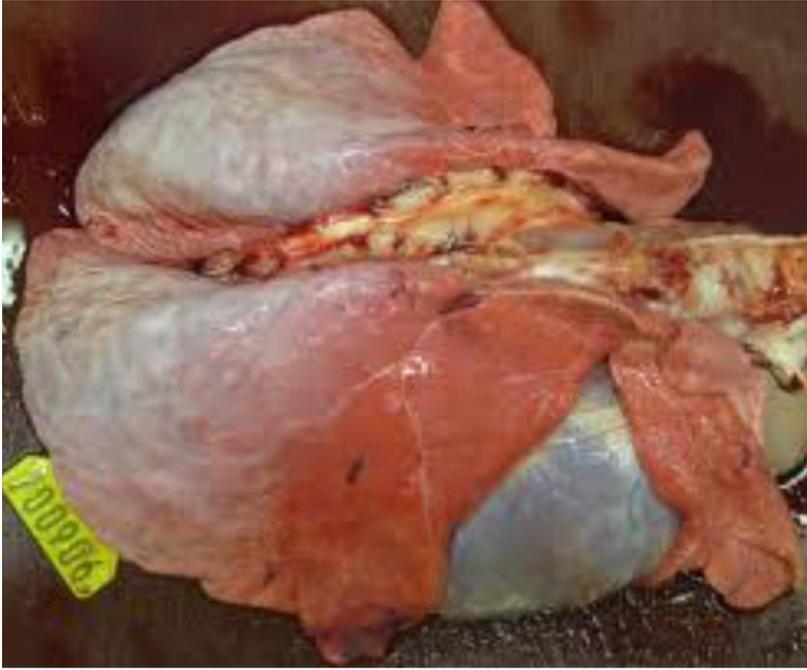
4⁺; A severe bruise occurring in zone 4



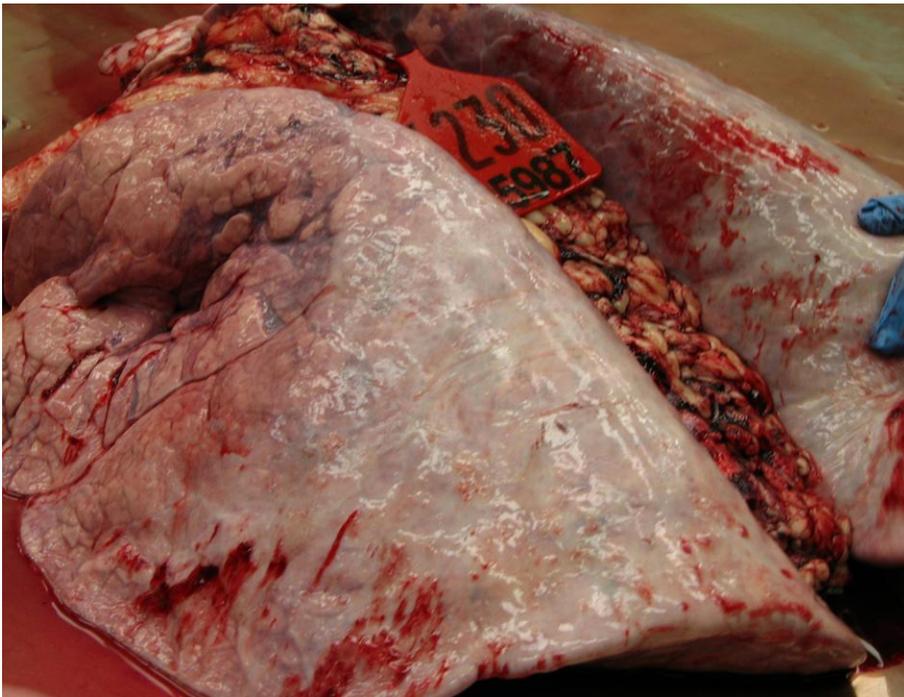
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Appendix 3.

“Normal” (0): Normal, healthy pink lung tissue throughout



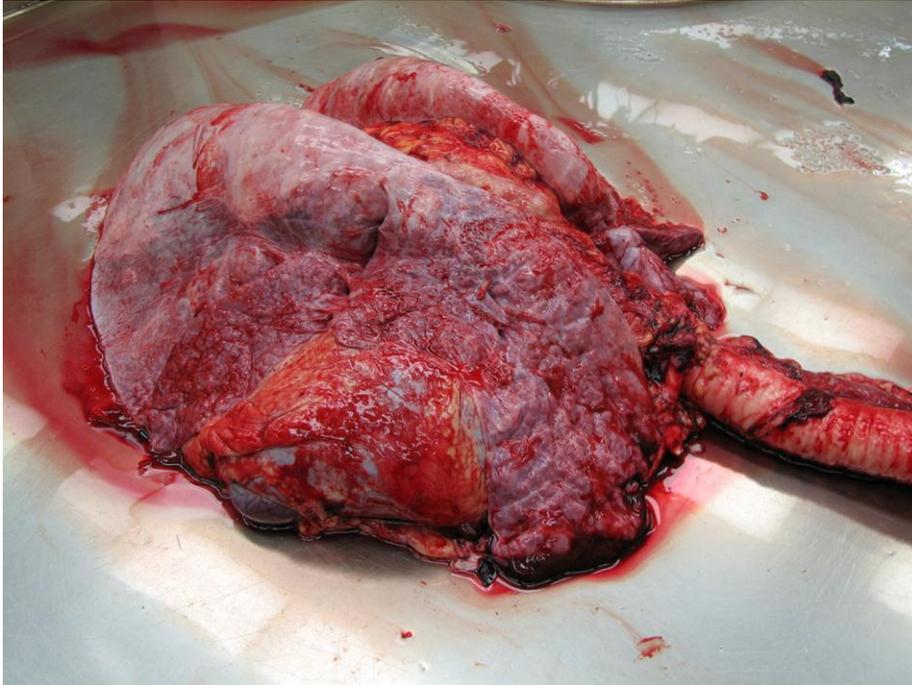
“Mild” (1) : Partial consolidation and atelectasis of the left cranial lung lobe (<50%)





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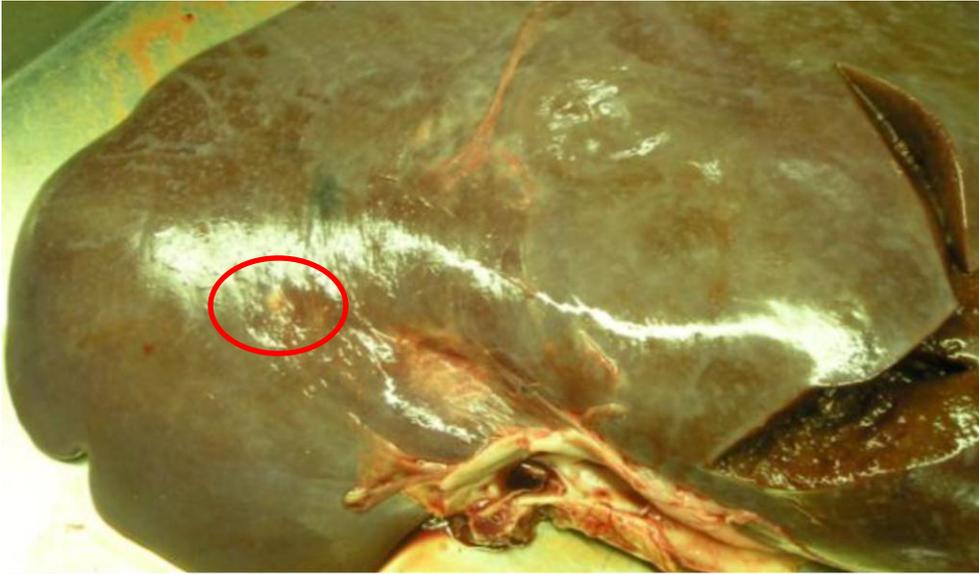
Severe (2): 90% Consolidation of the right cranial lung lobe and > 50% consolidation of the right middle and caudal lobes.





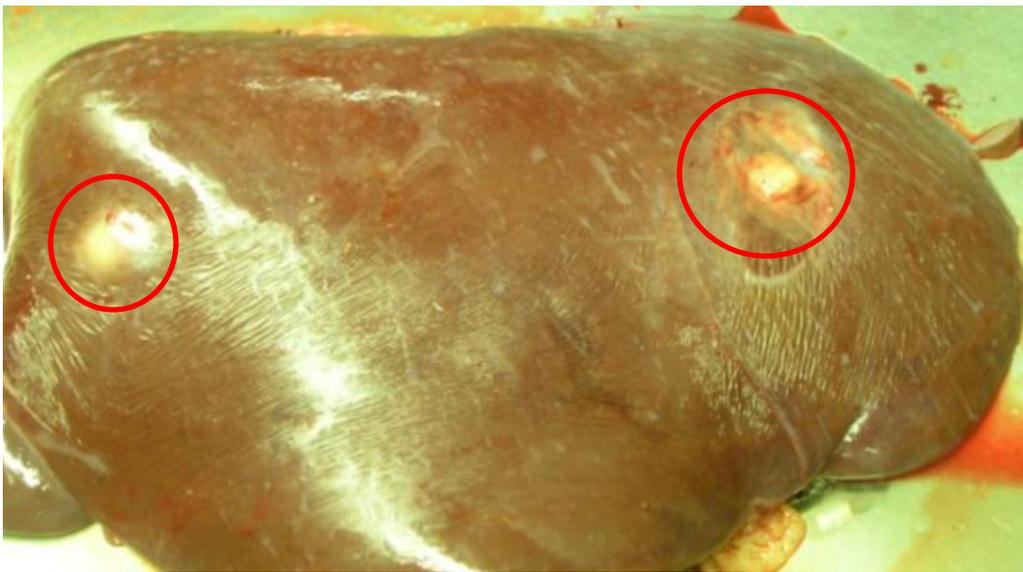
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Appendix 4.



A-: One small abscess

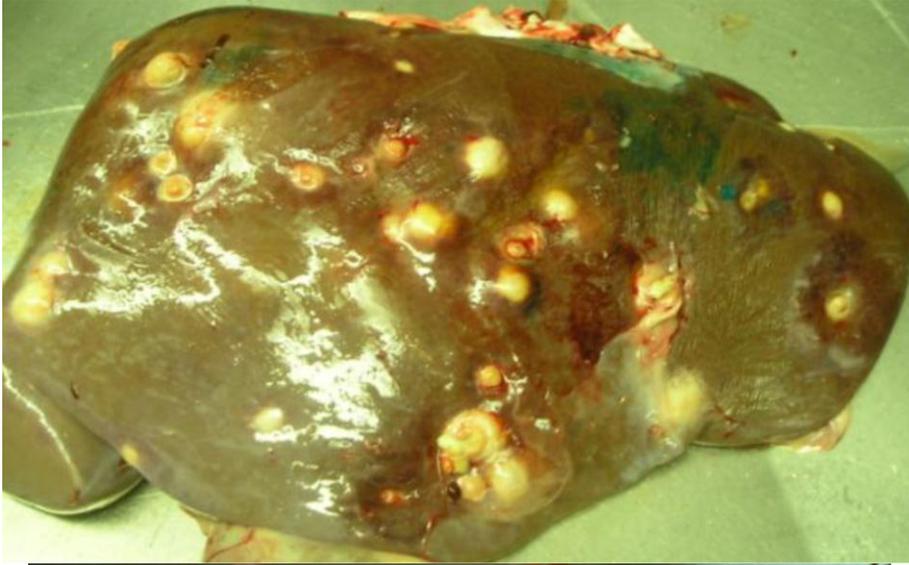
A: 2 abscesses approximately 3cm in diameter.





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A+ & A+A: Multiple abscesses and abscess adhered to the body wall.





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C: Cirrhosis



T: Telangiectasia



F: Liver Flukes (Distoma)



X: Contamination





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Liver Scoring		
S=Skip	N=Normal	A= Abscess; A= Adhesion
T=Telang	C=Cirrhosis	O=Open Abscess
F=Fluke/Parasite	X=Misc./Contamination	

Date _____

Location _____

Initials _____

Study ID _____

Carcass	Sequence	Score	Carcass	Sequence	Score
	1	S N A- A A+ A+A A+O A+OA T C F X		19	S N A- A A+ A+A A+O A+OA T C F X
	2	S N A- A A+ A+A A+O A+OA T C F X		20	S N A- A A+ A+A A+O A+OA T C F X
	3	S N A- A A+ A+A A+O A+OA T C F X		21	S N A- A A+ A+A A+O A+OA T C F X
	4	S N A- A A+ A+A A+O A+OA T C F X		22	S N A- A A+ A+A A+O A+OA T C F X
	5	S N A- A A+ A+A A+O A+OA T C F X		23	S N A- A A+ A+A A+O A+OA T C F X