

NEONATAL POST-MORTEM EXAMINATION CHECKLIST

Record information on the checklist during a lamb post-mortem using a dry erase marker. After the exam, the information may be transferred to a 'Neonatal Post-mortem Examination Record Sheet'*. The checklist can be cleaned with a damp cloth and reused. Exam details are available in the 'Neonatal Post-mortem Examination Guide'*. Please consult with your veterinarian if you need further assistance.

Step	CAUTION: Take precautions, including wearing gloves, when performing postmortems to avoid possible disease transmission. Pregnant women and others with lowered immunity are advised not to handle dead lambs.		
1	Record Information	Date of exam: _____ Lamb birth date: _____ Lamb age at death: _____ Ewe ID: _____ Number of lambs in litter alive: _____ Number dead: _____ Weather/ambient temperature: _____ Birth difficulties: Yes No Unknown Ewe behavior towards lamb: Attentive Uninterested Aggressive	
2	Examine the lamb and placenta for external physical abnormalities e.g. deformities, signs of trauma, decomposition, coat condition/colour, placenta. Consider taking pictures of the lamb as found.		
	Has the lamb walked? NO: Bottoms of hooves are soft. YES: Bottoms of hooves are hard.	NO	YES
3	Dissect the lamb & expose internal organs: Consider taking pictures at each step of the exam.		

Steps 4-5: Was the lamb alive at birth? (Note: If the lamb was observed alive after birth, go to Step 6.)		NO	YES
4	Did the lamb breathe after birth? NO: Lung is dark red; not inflated. Did not float in buoyancy test (i.e. lung tissue did not float when placed in container of water). YES: Lung is light pink (or red /pink mix); inflated. Floats in buoyancy test.	<input type="checkbox"/> Go to Step 5	<input type="checkbox"/> Go to Step 6
5	Is there evidence of tissue decay? NO: All tissues (particularly lung) look normal (i.e. light pink and pliable to touch). No unusual odour. YES: Any sign of decay or discolouration of tissues, dehydrated or mummified tissue and/or odour.	<input type="checkbox"/> Go to Step 6	<input type="checkbox"/> Go to Step 6
If both answers are ' White ' (and there was no delay in finding the carcass), the lamb died before birth. Treat as an infectious abortion. If Step 4 was ' Yes ', lamb was alive at birth. If both answers are ' No ', death occurred during or soon after birth, e.g. suffocation (afterbirth covering head), developmental abnormalities or dystocia (Step 6). <i>If you are unsure whether the lamb was aborted, treat as infectious until known otherwise.</i>			

Steps 6-8: Did the lamb die from dystocia (difficult birth)?		NO	YES
6	Is there evidence of hemorrhage (bleeding)? NO: Little to no blood in abdominal cavity. YES: Fluid or clotted blood in abdominal cavity.	<input type="checkbox"/> Go to Step 7	<input type="checkbox"/> Go to Step 7
7	Has the liver ruptured? NO: Surface of liver is smooth. YES: Liver has area(s) that appear jagged or cut.	<input type="checkbox"/> Go to Step 8	<input type="checkbox"/> Go to Step 8
8	Do head, neck, sternum and/or ribcage show signs of birth trauma? NO: Little or no edema (fluid) or bruising under skin in these areas. No broken ribs. YES: One or more of the following are present in these areas: Edema greater than 3mm thick; bruising; broken ribs.	<input type="checkbox"/> Go to Step 9	<input type="checkbox"/> See note below.

If one or more answers are '**Yes**' then the lamb likely died from dystocia. Look for other signs that can help confirm this diagnosis (e.g. yellow meconium staining on lamb's coat). **PLEASE NOTE** other sources of trauma may cause the signs listed above (e.g. predation or aggressive ewe). You may choose to end the exam if you are certain this was a difficult birth. If you are uncertain if the trauma was due to dystocia, continue exam and note trauma in Step 14.

Steps 9-11: Did the lamb die from starvation/mismothering/exposure?			NO	YES
9	Is all brown fat around the heart and kidneys gone?	<p>NO or partial: Light brown fat covering is present on heart and/or kidneys.</p> <p>YES: Fat around heart and/or kidneys completely depleted: appears dark red and has a soft, gelatinous texture.</p> <p><i>Note: Only extensive depletion is rated as 'Yes'.</i></p>	<input type="checkbox"/> Go to Step 10	<input type="checkbox"/> Go to Step 10
10	Is there a milk clot in the stomach?	<p>NO: Stomach is empty. No evidence of white milk clot.</p> <p>YES: White clot of milk present in the abomasum.</p>	<input type="checkbox"/> Go to Step 11	<input type="checkbox"/> Go to Step 11
11	Is there evidence of milk absorption in the gastrointestinal tract?	<p>NO: No sign of milk in intestines or supporting membranes</p> <p>YES: White scattered substance in the supporting membrane of the intestines.</p>	<input type="checkbox"/> May choose to end or go to Step 12	<input type="checkbox"/> Go to Step 12
<p>If all answers are 'Blue', starvation and/or exposure contributed to or caused the lamb's death. You may choose to end the exam or continue to Step 12. If all answers are 'White' or all are 'No', lamb likely did not die of this cause. If all answers are 'Yes', lamb died of exposure but had nursed (mismothering was likely not a factor).</p>				

Steps 12-16: Did the lamb die from 'Other' causes?			NO	YES
12	Is there infection around the navel?	<p>NO: Navel and surrounding tissue look normal.</p> <p>YES: Navel and surrounding tissue show excessive yellowish fluid, swelling and/or discolouration. Lambs will typically be more than 2-3 days old.</p>	<input type="checkbox"/> Go to Step 13	<input type="checkbox"/> Go to Step 13
13	Are there lesions on the liver?	<p>NO: Liver has a consistent colour and texture.</p> <p>YES: Liver shows discoloured areas and/or abnormal texture.</p>	<input type="checkbox"/> Go to Step 14	<input type="checkbox"/> Go to Step 14
14	Are there signs of trauma not due to dystocia?	<p>YES: Injuries anywhere on body (e.g. broken bones, bruising, edema, cuts, signs listed in Steps 6-8). Note any other evidence (e.g. aggressive ewe, predation).</p>	<input type="checkbox"/> Go to Step 15	<input type="checkbox"/> Go to Step 15
15	Is there an abnormality?	<p>YES: Examples include enlarged organs (liver, kidneys, heart), brittle/weak ribs, incomplete digestive system (lacking anus or lower portion of colon), digestive system blockage (e.g. did not pass meconium).</p>	<input type="checkbox"/> Go to Step 16	<input type="checkbox"/> Go to Step 16
16	Is the cause of death is unknown?	<p>This exam looks for the most common causes of death. At times you may go through the exam and not find conclusive results. Record all relevant information and contact your veterinarian for more extensive testing, if you are concerned. Pictures taken during the exam can be shared with the veterinarian to help with diagnosis.</p>		

Adapted from 'Lamb Post-Mortem Protocol for Use on Farm: To Diagnose Primary Cause of Lamb Death from Birth to 3 Days of Age', J.M. Everett-Hincks and S.J. Duncan. The Open Veterinary Science Journal, 2008, 2, 55-62 and Dr. Lynn Tait's presentation 'Neonatal Management: Why is my lamb dead and how could I have prevented this'.

*Full versions of these resources and more information about neonatal management are available from Alberta Lamb Producers (www.ablamb.ca or 403-948-8533).