

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

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**I. INTRODUCTION**

Veterinarians employed by the Ohio State Racing Commission (OSRC) are responsible for collecting blood specimens for total carbon dioxide (tCO<sub>2</sub>) testing from horses selected by the OSRC or racing officials. Furthermore, OSRC veterinarians are responsible for verifying the identity of horses from which the specimens are obtained, for ensuring that all specimens are properly processed and sealed, and that unique specimen identification labels are affixed to them. Finally, OSRC veterinarians are responsible for completing an external chain of custody record that documents specimen collection, sealing, and packaging for shipment to the testing laboratory. This standard operating procedure was prepared for OSRC veterinarians to guide them in performing these duties. Deviations from these procedures will cause specimens to be invalidated if their integrity or unbroken chain of custody cannot be verified.

**II. SCOPE**

This standard operating procedure specifies procedures to be followed by Ohio State Racing Commission veterinarians and veterinary assistants when collecting blood specimens for tCO<sub>2</sub> testing and preparing them for shipment to the testing laboratory. Refer to Analytical Toxicology Laboratory standard operating procedure section 204 "*Collection and Handling Procedures for Official Horse Post-Race Blood and Urine Specimens*" for procedures to be followed when collecting and shipping post-race blood and urine specimens. Standard operating procedures for post-race specimens and pre-race specimens are identical in many respects.

**III. PRINCIPLE OF METHOD**

The procedures specified in this standard operating procedure are based on the principles that the animal from which each specimen is collected must be positively identified and that the specimen collected from each animal must be uniquely labeled so that the origin of each specimen can be unambiguously determined and demonstrated. Furthermore, the personnel responsible for specimen collection are provided standardized collection materials and are required to record all information in a standardized and prescribed manner using forms specifically designed for that purpose.

**IV. REFERENCE PROCEDURES**

- A. *OSU Analytical Toxicology Laboratory Standard Operating Procedures Manual Section 204 ("Collection and Handling Procedures for Official Horse Post-Race Blood and Urine Specimens")*

**STANDARD OPERATING PROCEDURES  
ODA ANALYTICAL TOXICOLOGY LABORATORY**

Section Code: 205  
Effective Date: 10/09/06  
Supersedes: 01/27/06  
Page: 2 of 12

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

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**V. DEFINITIONS AND ACRONYMS**

- A. OSRC – Ohio State Racing Commission
- B. ATL – Analytical Toxicology Laboratory

**VI. SUPPLIES**

- A. *OSRC Horse Specimen Identification Tag* (General Business Forms, Skokie, IL 60077, or equivalent). Form # ATL 1990-02.
- B. *External Chain of Custody Form* (General Business Forms, or equivalent). Form # ATL 1996-08.
- C. Tamper Evident Specimen Seals (NovaVision, Bowling Green, OH 43402, Electronic Imaging Corporation, 180 Emerald Street, Keene, NH 03431, Sirchmark™, cat. no. SM2000 or equivalent, Sirchie® Finger Print Laboratories, Inc., Youngsville, NC 27596, or equivalent). Form # ATL 2000-04.
- D. Alphanumeric Bar-code Specimen Seal Number labels, code 128 B (NovaVision, or equivalent).
- E. Specimen Shipping Container Plastic Padlock Seals (cat. no. 617, E.J. Brooks Company, Newark, NJ 07107, or equivalent).
- F. Vacutainer® Serum Separator Tubes (11-mL, cat. no. 02-657-10, Fisher Scientific, Pittsburgh, PA 15238-2911, or equivalent).
- G. Blood collection needles, 20 gauge, 1½" (cat. no. 14219-176, VWR International, Obetz, OH 43207, or equivalent).
- H. Transport bags with liquid-tight closure without biohazard logo (6" x 10", cat. no. 304-WO, Substance Abuse Specialties, Inc., Marietta, GA 30066, or equivalent).
- I. Absorbent pads (120-mL urine capacity, 6" x 6", cat. no. 403, Substance Abuse Specialties, Inc., or equivalent).
- J. Bill of lading shipping forms from US Cargo and Courier Corporation or other approved courier.

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

---

**VII. APPARATUS/OTHER SUPPLIES**

- A. Centrifuge
- B. Test tube racks
- C. Insulated bags (Thermos<sup>®</sup>, or equivalent)
- D. Cold packs
- E. Zip-lock bag
- F. Lockable refrigerator
- G. Specimen-shipping container
- H. Permanent Marker

**VIII. PROCEDURES FOR COLLECTION OF BLOOD SPECIMENS FOR TCO<sub>2</sub> TESTING**

- A. Prepare a *Horse Specimen Identification Tag* for each horse selected for testing. Complete the top portion of the form by circling the appropriate two-letter abbreviation of the racetrack name and recording the race date, race number, finish-position, sex, age, tattoo number, and name of the horse. Record the post-position of the horse as the finish-position on this form. See Figure 1.
- B. Circle the appropriate abbreviation for the racetrack name and record the date of the race on three of the short, bar-coded specimen identification labels on the *Horse Specimen Identification Tag*. See Figure 1.

**STANDARD OPERATING PROCEDURES  
ODA ANALYTICAL TOXICOLOGY LABORATORY**

Section Code: 205  
Effective Date: 10/09/06  
Supersedes: 01/27/06  
Page: 4 of 12

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

**OHIO STATE RACING COMMISSION** 294483

BP NF SD (LE) RW RD TH FAIR \_\_\_\_\_

6/23/04 1 1 6 2 X0222  
DATE RACE # FINISH SEX AGE TATTOO NUMBER

NAME OF HORSE: FURY

URINE	BLOOD
I HEREBY CERTIFY THAT I WITNESSED THE COLLECTION AND SEALING OF THIS SAMPLE.	I HEREBY CERTIFY THAT I WITNESSED THE COLLECTION AND SEALING OF THIS SAMPLE.
_____ WITNESS SIGNATURE	<u>John Joyner</u> WITNESS SIGNATURE
_____ OSRC LICENSE #	<u>79482</u> OSRC LICENSE #
_____ COLLECTOR'S SIGNATURE	<u>Buggh</u> VETERINARIAN'S SIGNATURE
DATE _____ TIME _____	DATE <u>6/23/04</u> TIME <u>8:18 pm</u>

  
6/23/04 294483

  
6/23/04 294483

  
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**Figure 1. OSRC Horse Specimen Identification Tag Form # ATL 1990-02.**

- C. Confirm the identity of the horse by comparing the tattoo number on the horse with the tattoo number recorded on the *Horse Specimen Identification Tag* before the blood specimen is collected.
- D. Request the trainer or trainer's representative to witness the collection and sealing of the blood specimen.
- E. Collect one tube of blood from a jugular vein of the horse. Mix the blood in the tube by gently inverting it five times.
- F. **Without delay**
  1. Seal the specimen tube by placing a Tamper Evident Specimen seal over the top of the rubber stopper and down 2 sides of the tube. See Figure 2.

**NOTE:** Handle the Tamper Evident Specimen seal very carefully. Touching the adhesive surface of the seal can destroy the seal's tamper evidence properties; note that the seal cannot be repositioned once it has

## COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING

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been applied. If a seal is poorly applied, place a second seal over the top of the rubber stopper on the blood tube and document this action on the *External Chain of Custody* form.



**Figure 2 Pre-race blood collection tube with specimen identification label and tamper evident seal affixed.**

2. Remove one of the short, marked, bar-coded specimen identification labels from the *Horse Specimen Identification Tag* and affix it to the blood collection tube. This label is used to uniquely identify the specimen. **Do not** place the label on the tamper evident seal.
  3. Appropriately discard all blood collection supplies after each blood specimen has been collected. Take all necessary precautions to avoid contamination of subsequent blood specimens.
- G. Request the trainer or trainer's representative who witnessed the collection and sealing of the blood specimen to sign his or her name and record his or her OSRC License number on the lines marked **Witness Signature** and **OSRC License #**, respectively, on the right-hand **BLOOD** section of the *Horse Specimen Identification Tag*. See Figure 1.
- H. Sign and record the date and time of the specimen collection on the lines marked **Veterinarian's Signature**, **Date**, and **Time**, respectively, in the **BLOOD** section of the *Horse Specimen Identification Tag*. See Figure 1.
- I. Place the labeled tube upright in a test tube rack. Allow each blood specimen to clot for approximately thirty minutes at room temperature before centrifuging.
- J. Centrifuge the specimen(s) for approximately ten minutes. **Do not remove the rubber stopper from the top of the tube at any time.**

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE tCO<sub>2</sub> TESTING**

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- K. Place all the blood specimens collected from a single race and an appropriate number of absorbent pads in a transport bag and seal the bag. Verify that the bag is properly sealed.
- L. Place an **Alphanumeric Bar-code Specimen Seal Number** label on the exterior of the specimen transport bag. See Figure 3. This number will be recorded in the column headed **Transport Bag Seal Number** on the *External Chain of Custody* form as instructed later in Section IX.E.



**Figure 3. Specimen transport bag with Alphanumeric Bar-code Specimen Seal number affixed.**

- M. Place the sealed blood tube(s) upright in a refrigerator that is kept locked except when accessing it to store specimens.
  - N. Separate the top and bottom sheets of each *Horse Specimen Identification Tag*. Retain the bottom portion of each *Horse Specimen Identification Tag* for your records and forward the top sheet to the Ohio State Racing Commission.
- IX. COMPLETING THE EXTERNAL CHAIN OF CUSTODY FORM AND PREPARATION FOR SHIPMENT**
- A. Prepare *External Chain of Custody* form(s) for the specimens collected for tCO<sub>2</sub> testing by recording the name of the racetrack and the race date in the designated spaces in the upper right-hand corner of the *External Chain of Custody* form(s). See Figure 4.



**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

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- F. Verify all entries for each horse. A veterinary assistant or the OSRC veterinarian may perform this review; the person performing the review should document this procedure by recording their initials in the column headed **VERIFIED URINE & BLOOD TAG NUMBER**.
- G. Record any comments or special instructions in the column headed **COMMENTS/INSTRUCTIONS**.
- H. Place a freezer pack in the bottom of an insulated bag; place the specimens on top of the freezer pack and close the bag.
- I. Place the insulated bag in a specimen-shipping container after all pre-race and post-race specimens have been prepared, packaged, and sealed. Compress the bag if necessary, but exercise care to avoid breaking the tubes.
- J. When all pre-race and post-race specimens have been collected, place the specimens in the specimen-shipping container if they are not already in the container.
- K. When the specimen-shipping container is ready to be sealed, sign your name and record the date, time, total number of *External Chain of Custody* forms and the identification number of the Specimen-Shipping Container Padlock (plastic seal) at the bottom of each *External Chain of Custody* form. If more than one *External Chain of Custody* form was used, record the identification number of the padlock on each form. Record the same date and time of sealing of the specimen-shipping container on each *External Chain of Custody* form. If there is more than one specimen-shipping container, record all padlock identification numbers on all *External Chain of Custody* forms.

Note that the date and time that are to be recorded on the *External Chain of Custody* form(s) are the actual date and time at which you sign this record. The race date is entered on the *External Chain of Custody* form(s) in the upper right-hand corner and may be different from the date on which you sign the record. If the *External Chain of Custody* form(s) is signed after midnight of the race date, the date of signing must be one calendar day later than the race date.

The date and time of closing the Specimen-Shipping Container Padlock should be the same on each *External Chain of Custody* form.

- L. Verify that all information has been recorded and that all items have been placed in the specimen-shipping container. Place the top sheet of each *External Chain of Custody* form in the specimen-shipping container. Retain the bottom sheet of each *External Chain of Custody* form for your records.

**STANDARD OPERATING PROCEDURES  
ODA ANALYTICAL TOXICOLOGY LABORATORY**

Section Code: 205  
Effective Date: 10/09/06  
Supersedes: 01/27/06  
Page: 9 of 12

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

- M. Using a permanent marker, record the racetrack name abbreviation and the race date on the back of the padlock(s). **Do not place the padlock(s) on the specimen-shipping container(s) until everything has been placed inside the container(s).**
- N. Seal the specimen-shipping container(s) using the padlock(s); verify that each seal is secure. **If the specimen-shipping container is sealed, it cannot be reopened without cutting the metal wires securing the seal with wirecutters.**
- O. If there is a need to remove the padlock, draw one line through the **Box Seal Number** recorded on the *External Chain of Custody* form(s), record the new padlock number, and then date and initial the correction. **Place the removed padlock in the specimen-shipping container.** Record the initials of the racetrack and the race date on the back of the new padlock and reseal the specimen-shipping container.
- P. Prepare a shipping bill of lading form and affix it to the specimen-shipping container. Describe the contents of the container in block #5 as “samples” and record your name, the date, and the time in block #6 under **Shipper’s Signature**. See Figure 5.

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Bill of Lading No. **602436**

<b>1. FROM:</b> First Name (Person) <b>Dr. Warren</b> Your Account Code <b>OSRA</b>		<b>2. TO:</b> First Name (Person) <b>Daniel Hill</b> Phone Number (Important) <b>(614)466-9773</b>	
Company Name <b>River Downs State Testing Barn</b>		Company Name <b>Analytical Toxicology Labs</b>	
Street Address <b>6301 Kellogg Ave</b>		Street Address (No P.O. Box deliveries) <b>8995 E. Main Street 140 Bldg 3</b>	
City <b>Cincinnati</b> State <b>OH</b> Zip <b>45230</b>	City <b>Reynoldsburg</b> State <b>OH</b> Zip <b>43068</b>		
<b>3. Service Options</b>			
Overnight by: Select Product (select one)		Miscellaneous Options	
<input type="checkbox"/> 8:00 A.M. <input type="checkbox"/> 5:00 P.M. <input type="checkbox"/> 12 Noon <input type="checkbox"/> 2nd Day <input type="checkbox"/> 10:30 A.M. <input type="checkbox"/> Same Day		<input type="checkbox"/> Other _____ <input type="checkbox"/> Saturday Service PU _____ DL _____ <input type="checkbox"/> Additional Declared Value (at \$ 50 Per \$100) \$ _____	
<b>4. Payment Options</b>		<b>6. Shipper's Signature</b>	
<input type="checkbox"/> Bill shipper <input checked="" type="checkbox"/> Bill Recipient (Acct. Code Req.) <b>OSRA</b> <input type="checkbox"/> Bill Third Party (Acct. Code Req.) _____ <input type="checkbox"/> C.O.D. Amount _____		X <i>[Signature]</i> Date <b>9/5/05</b> By Signature, Shipper Accepts Conditions on Reverse Time <b>7:30</b>	
		<b>Recipient's Signature</b>	
		X _____ Date _____ Time _____	
<b>5. Description</b>			
Description <b>SAMPLES</b>		Pieces	Weight
<b>For Courier Use Only</b>			
Pickup Courier ID #	Route #	Date	Time
Delivery Courier ID #	Route #	Date	Time
Reference # or Comment			Cost Code

SHIPPERS COPY

Figure 5. Bill of lading form from U.S. Cargo.

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

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Note that deviations from these instructions that are noted by our laboratory personnel during specimen accessioning procedures will be recorded and reviewed by appropriate personnel to assess their significance and probable effect(s) on specimen integrity.

**X. CORRECTIONS**

Correct any recording error by drawing a single line through the error without obliterating or obscuring the original entry and make the necessary correction. Record the date, your initials, and a brief explanation for each correction.

**XI. RESPONSIBLE INDIVIDUALS**

- A. Ohio State Racing Commission veterinarians
- B. Veterinary assistants
- C. Specimen custodian
- D. Supervisor of the Specimen Accession Area

**Revised by:**

Dr. Richard Sams and Lucille Kaminski

**Revision History:**

A summary of the procedural changes for this standard operating procedure is indicated below.

Changes in the Third Revision Effective 10/09/06:

- 1. Section VI.C - F, J – Allowed for more options of vendor or product.
- 2. Section IX Figure 4 – Updated example.

Changes in the Second Revision Effective 01/27/06:

- 1. Section I – Last sentence added.
- 2. Section II – Last two sentences added.
- 3. Section IV – Dropped reference procedure.
- 4. Section VI.G – Updated supplier.
- 5. Section VIII.C – Added when to perform the activity.
- 6. Section VIII.F.1 Note – Added instruction regarding second seal.
- 7. Section VIII.L – Added last sentence.

**STANDARD OPERATING PROCEDURES  
ODA ANALYTICAL TOXICOLOGY LABORATORY**

Section Code: 205  
Effective Date: 10/09/06  
Supersedes: 01/27/06  
Page: 11 of 12

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

---

8. Sections IX.A Figure 4, E, K – Revised *External Chain of Custody* form: dropped recording the sex of the horse, changed column title (*i.e.*, *Transport Bag Seal Number*), and added recording the total number of pages.
9. Section IX.F - . Dropped allowing a checkmark to indicate that entries had been verified.
10. Section IX.J – Added regarding storage of specimen in the shipping container.
11. Section IX.K – Added second and third paragraphs regarding date and time recorded on each page of the *External Chain of Custody* form.
12. Section IX.L, O – Dropped instruction to place the *External Chain of Custody* form or broken seal in a bag prior to shipping.
13. Section IX.N – Added to verify that the seal is secure.
14. Section IX.P, Figure 5 – Added second sentence specifying to fill in boxes 5 and 6 and dropped filling in box 3 on the Bill of Lading.

Changes in the First Revision:

1. Sections IV, V – New sections.
2. Section VI.C, D – Tamper evident seal changed. Separate bar-code number labels added.
3. Section VI.H,I – Type of specimen transport bag changed and absorbent added.
4. Section VIII.B – Less specimen identification tags required. Figure 1 added.
5. Section VIII.F – Specimen seal on blood tube changed; note added regarding handling the seal. Figure 2 added.
6. Section VIII.F.3 – Instruction to avoid contamination specified.
7. Section VIII.K – Blood specimens to be added to one versus individual transport bags with absorbent.
8. Section VIII.L – Bar-code numbers to be added to exterior of transport bags. Figure 3 added.
9. Section IX.A, F – Figure 4 added. Bar-code numbers to be documented on external chain of custody form.
10. Section IX.P – Bill of Lading criteria specified.
11. Section XI – Revision history added.

First Effective Date: 04/16/02.

**STANDARD OPERATING PROCEDURES  
ODA ANALYTICAL TOXICOLOGY LABORATORY**

Section Code: 205  
Effective Date: 10/09/06  
Supersedes: 01/27/06  
Page: 12 of 12

**COLLECTION AND HANDLING PROCEDURES FOR BLOOD SPECIMENS FOR POST-RACE TCO<sub>2</sub> TESTING**

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**Approved by:**

Signature on File                      09/29/06  
\_\_\_\_\_

Lucille Kaminski-QAC                      Date

Signature on File                      09/29/06  
\_\_\_\_\_

Richard Sams, PhD                      Date  
Technical Director