

Blood control and athlete's passport (purpose and practice)



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Medical & Antidoping Commission



IAAF blood testing protocol 2008

- **Blood Sampling:**
for the detection of prohibited substances and methods (blood transfusions, HBOCs, etc.)

- **Blood Screening:**
the blood parameters measured may be used in any event for the purposes of establishing individual athlete blood profiles in Athletics (hematological passport) or for target testing purposes, or for both.

IAAF blood testing protocol 2008



- **Blood sampling**

for the detection of Prohibited Substances and Prohibited Methods (blood transfusions, HBOCs, hGH, etc.):

2 tubes X 3 ml

**(anticoagulant ie. EDTA), or
2 tubes X 5 ml (serum separator gel and clotting activator factor).**

- **Blood screening**

for the measurement of individual Athlete blood parameters :

1 tube x 3 ml

(anticoagulant ie. EDTA).

Different steps: various protocols

- ***Preparation (pre collection procedures).***
- ***Sample collection (collection protocol).***
- ***Post-test processing and administration (storage and transport protocol).***
- ***Analysis of blood parameters and/or of prohibited substances and methods (analytical protocol).***

All the steps are very crucial to permit the use of results both for "direct" or "indirect" (passport) antidoping purposes.

Blood collection facility (IAAF 2008)

- A room or facility equipped for blood sampling may be set up at the Doping Control Station and/or at any other site at which the athletes are to be located for testing (hotel, medical centre, training centre etc.).***
- The room to be used for blood sampling should normally be separate from any room used for the collection of urine samples and should be designed to maintain an athlete's privacy and confidentiality at all times.***

Blood collection facility (WADA 2008)

- ❑ ***NOTE 1: Although the term Blood Collection Facility is used, for out-of-competition testing this facility might be an Athlete's home or a hotel room, rather than an officially designated facility for doping control, as long as it meets the minimum criteria in 5.2.2.***
- ❑ ***NOTE 2: The Blood Collection Facility may be located adjacent to, or in the same suite of rooms as the doping control station where urine sample collection is to take place.***
- ❑ ***5.2.2 The minimum requirements to be met to enable use of a facility as a Blood Collection Facility are privacy and cleanliness.***

Blood collection station

.....practically, for an optimal blood collection, the following points are important :

- ***Size of the room.***
- ***Material, equipment, furniture (chairs, working table(s), bed (for any medical problem or request).***
- ***Refrigerator (to keep refrigerated the collected blood samples, during the session).***
- ***Hygiene.***
- ***Temperature conditions.***

******Check always in previous day(s), before collection session, the location and furniture of blood collection room.***

WADA - GUIDELINES FOR BLOOD SAMPLE COLLECTION (June 2008)

- **Sterile needles** • **Butterfly needles** • **Disposable plastic syringes**
- **Vacutainer collection tubes to draw a predetermined volume of blood (these may include serum separator tubes or and/or EDTA (anti-coagulant) tubes, as required).**
- **Sterile disinfectant pads.** • **Gloves providing barrier protection**
- **Tourniquets**
- **A disposal container for bio - hazardous waste**
- **A bio - hazard spill kit**
- **Adhesive bandage and gauze**
- **A cold-box - Secure transport containers - Secure transport bags and seals.**
- **Transport temperature monitoring device**
- **All doping control documentation, including doping control forms, Athlete notification forms, supplementary report forms, chain of custody forms, etc**

Mandatory !

- ***Correct kits (1 or 2 tubes; whole blood or serum) for the requested type of blood sampling control !!***
- ***Check always the material (kits) before starting with a blood antidoping session.***
- ***Test the kits and train in advance the BCOs and DCOs involved in the procedure.***

Bereg kit small 94-1094 + accessory package for blood serum 94-1096



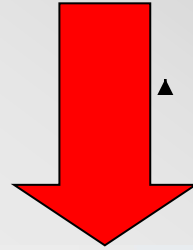
Bereg Kit small 94-1094 + accessory package for whole blood 94-1095



Mini kit 94-1082 and 94-1084 for blood screening on site



Small single “easy” and small single
“top” 94-1098 + accessory package
94-1093 and 94-1099



CONSENT or REFUSAL

- ❖ ***No blood sample shall be taken from an athlete, unless he has first given his written consent to such sampling.***
- ❖ ***In case of refusal:***
 - **immediate report to IAAF (disciplinary procedure);***
 - **immediate urine sample to be analysed for substances and methods included in the banned list, including rh-EPO.***



Please write legibly and in CAPITAL letters / Ecrire lisiblement en majuscules

BLOOD SAMPLING FORM FORMULAIRE DE PRELEVEMENT SANGUIN

TESTING AUTHORITY • AUTORITE DE CONTROLE	SAMPLE COLLECTION AGENCY • AGENCE DE PRELEVEMENT

1. ATHLETE INFORMATION • RENSEIGNEMENTS SUR L'ATHLETE

FAMILY NAME NOM DE FAMILLE	<input type="text"/>	GIVEN NAME PRENOM	<input type="text"/>	DATE OF BIRTH DATE DE NAISSANCE	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
NATIONALITY NATIONALITE	<input type="text"/>	EVENT DISCIPLINE	<input type="text"/>	YES - OUI NO - NON	DOCUMENT TYPE TYPE DE DOCUMENT
ADDRESS ADRESSE	<input type="text"/>			DOCUMENT NUMBER NUMERO DU DOCUMENT	<input type="text"/>
NUMBER / STREET • NUMERO / RUE		CITY / TOWN • VILLE			
<input type="text"/>					
STATE • PROVINCE		COUNTRY • PAYS		CONTACT TEL. (INCL. COUNTRY CODE) • TEL. CONTACT (INCL. CODE PAYS)	
				E-MAIL	

2. NOTIFICATION / CONSENT • NOTIFICATION / CONSENTEMENT

TYPE OF TEST REQUIRED TYPE DE CONTROLE REQUIS	<input checked="" type="checkbox"/> BLOOD - SANG	DATE	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	COUNTRY PAYS	<input type="text"/>	CITY VILLE	<input type="text"/>	TIME HEURE	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
COMPETITION	<input type="text"/>			DOC / CHAPERONE NAME NOM DE L'ACD / ESCORTE	<input type="text"/>		REPORT NO LATER THAN SE PRESENTER AU PLUS TARD A	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
				DOC / CHAPERONE SIGNATURE SIGNATURE DE L'ACD / ESCORTE	<input type="text"/>				

I CONFIRM THAT THE PURPOSE OF THE BLOOD SAMPLING HAS BEEN EXPLAINED TO ME AND I UNDERSTAND THAT, BY SIGNING THIS FORM, I AM GRANTING MY CONSENT TO A BLOOD SAMPLE BEING TAKEN FROM ME.

JE CONFIRME AVOIR ETE INFORME DE LA FINALITE DU PRELEVEMENT SANGUIN ET CONSENS, EN SIGNANT CE FORMULAIRE, A ME SOUMETTRE A CE PRELEVEMENT.

ATHLETE'S SIGNATURE • SIGNATURE DE L'ATHLETE

3. INFORMATION FOR ANALYSIS • INFORMATIONS POUR L'ANALYSE

OUT OF COMPETITION
HORS COMPETITION

PRE COMPETITION

IN COMPETITION
EN COMPETITION

Blood collection

- ***No collection within 2 hours from training session or competition. If already notified, the athlete shall be monitored in the meantime.***
- ***The athlete is requested to sit for almost 10 minutes before collection (waiting time, or time-out practically needed to fill in the form with the athlete).***

NOTE: check and write always the arrival time of the athlete to antidoping station.

Blood collection

❖ **The schedule of blood tests PRE Competition is one of the most difficult issues, based on the:**

- **late arrivals of the teams (1-2 days before in Area competitions);**
- **LOC organized training sessions or competition venue visits;**
- **accreditation, meals, meetings etc.**

- ❑ **The best schedule is to start blood collection tendencially early in the morning (ie h. 7.30-8.00), before training sessions.**
- ❑ **Also meals time is useful for notification and collection.**
- ❑ **Arrival time is useful, but not the best after a long trip.**
- ❑ **Be sure to have enough number of BCOs, DCOs and chaperones for the time consuming administrative work.**

IAAF blood collection protocol

Important information

- ***Altitude of the Doping Control Station and the name of the place where the sample was collected (with the postal code).***
- ***Previous training (when).***
- ***Previous meal (when).***
- ***Previous altitude training in the last 2 weeks.***
- ***Previous use of hypoxic devices (specify).***
- ***Blood donation or haemorrhage or transfusion in the last 3-6 months.***
- ***INFORMATION ON MEDICATIONS IS NOT MANDATORY AND IS NOT REQUESTED.***

I CONFIRM THAT THE PURPOSE OF THE BLOOD SAMPLING HAS BEEN EXPLAINED TO ME AND I UNDERSTAND THAT, BY SIGNING THIS FORM, I AM GRANTING MY CONSENT TO A BLOOD SAMPLE BEING TAKEN FROM ME.

JE CONFIRME AVOIR ETE INFORME DE LA FINALITE DU PRELEVEMENT SANGUIN ET CONSENS, EN SIGNANT CE FORMULAIRE, A ME SOUMETTRE A CE PRELEVEMENT.

ATHLETE'S SIGNATURE • SIGNATURE DE L'ATHLETE

3. INFORMATION FOR ANALYSIS • INFORMATIONS POUR L'ANALYSE

OUT OF COMPETITION
HORS COMPETITION

☐

PRE COMPETITION

☐

IN COMPETITION
EN COMPETITION

☐

COMPETITION

DATE OF THE TEST
DATE DU CONTROLE

DD / JJ		MM		YYYY / AAAA			

GENDER
SEXE

<input type="checkbox"/>	<input type="checkbox"/>
M	F

ARRIVAL TIME AT DOPING CONTROL STATION
HEURE D'ARRIVEE A LA STATION DE CONTROLE ANTIDOPAGE

	•	•	

LAST TRAINING • DERNIER ENTRAÎNEMENT

LAST FOOD INTAKE • DERNIERE PRISE ALIMENTAIRE

BLOOD /
SANG

☐ 1 tube
☐ 2 tubes

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BLOOD SAMPLE CODE NUMBER • NUMERO DE CODE D'ÉCHANTILLON DE SANG

	•	•	

TIME • HEURE

DECLARATION OF BLOOD TRANSFUSIONS : LIST ANY TRANSFUSIONS RECEIVED OVER THE LAST 6 MONTHS.
DECLARATION DE TRANSFUSIONS SANGUINES : INDICUER LES TRANSFUSIONS REÇUES AU COURS DES 6 DERNIERS MOIS.

4. CONFIRMATION OF PROCEDURE FOR BLOOD TESTING • CONFIRMATION DE LA PROCEDURE POUR LE CONTROLE SANGUIN

COMMENTS : ANY COMMENTS SHOULD BE NOTED HERE. IF NECESSARY CONTINUE ON A SUPPLEMENTARY REPORT FORM.
COMMENTAIRES : TOUTS LES COMMENTAIRES DOIVENT ETRE INSCRITS ICI. LE CAS ECHEANT, UTILISER LE FORMULAIRE DE RAPPORT COMPLEMENTAIRE

SUPPLEMENTARY REPORT FORM ?
FORMULAIRE DE RAPPORT COMPLEMENTAIRE ?

☐

I CERTIFY THAT I HAVE PROVIDED THE ATHLETE WITH EVIDENCE OF MY QUALIFICATION TO TAKE A BLOOD SAMPLE AND THAT THE BLOOD SAMPLE COLLECTION WAS CONDUCTED IN ACCORDANCE WITH THE RELEVANT IAAF REGULATIONS
J'ATTESTE AVOIR FOURNI LA PREUVE DE MA QUALIFICATION EN QUALITE D'AGENT DE PRELEVEMENT SANGUIN ET PROCÉDÉ AU PRÉLEVEMENT SANGUIN CONFORMÉMENT À LA RÉGLEMENTATION DE L'IAAF EN VIGUEUR

BLOOD COLLECTION OFFICER • AGENT DE PRELEVEMENT SANGUIN

NAME / NOM

SIGNATURE

WADA - GUIDELINES FOR BLOOD SAMPLE COLLECTION (June 2008)

5.6.1 The DCO/*Chaperone* shall ensure that the *Athlete* is escorted from the place of notification to the Blood Collection Facility under constant supervision.

5.6.2 The DCO/*Chaperone* can not prevent the *Athlete* eating or drinking products of their choice, but shall recommend that the *Athlete* chooses from a selection of individually sealed, non-caffeinated and non-alcoholic beverages in order to hydrate. The DCO/*Chaperone* shall not handle food or drink items for the *Athlete*.

WADA - GUIDELINES FOR BLOOD SAMPLE COLLECTION (June 2008)

- ***When collecting blood for doping control purposes, the protection of the Athlete and Sample Collection Personnel is paramount.***
- ***The process must be carried out by experienced professionals who possess qualifications in phlebotomy recognized by the relevant public authorities, and the highest standards of hygiene and safety must be maintained at all times.***

Application of tourniquet and collection

- ***Not long time before collection of sample.***
- ***Not much tightened (enough for vein dilation)***
- ***Preferable on not dominant arm.***
- ***Release as the blood begins entering into the tube.***
- ***Tightening of tourniquet should possibly not exceed 60 seconds***
- ***Once removed the tube from the holder, gently homogenize the blood in the tube manually by inverting the tube gently at least 3 times.***
- ***The BCO ensures that the blood in the tube is homogenized once again manually by gently inverting it at least 5 times.***

WADA - What in case of failed blood collection attempt?

- ***5.8.19 - In the event that the BCO is unable to draw sufficient blood from the first attempt, up to three attempts in total shall be made before the DCO, in consultation with the BCO, decides to terminate collection. No more than three attempts to insert a needle into the Athlete's body shall be made. The DCO shall record the reasons for terminating the collection attempt.***

IAAF – What in case of insufficient blood amount or failed venipuncture?

- ***The needle has failed to enter in the vein: remove, discard the needle and select another kit and another collection location (other arm).***
- ***Blood stops flowing: remove temporarily the tube and wait if the collapsed vein recovers. If the vein does not recover, remove, discard the needle and select another kit and another collection location (other arm).***

Technical aspects while using of EDTA vacutainer tubes

- **Some athlete, will controlling the tube will ask what are some drops in the tube (EDTA)!!**
- **NOTE that it is important to fill the tube as better as possible. The collection of less than 3 ml (ie 1,5 ml, for many occasional reasons) may decrease the Hb level up to 2-3% (ie: $14 > 13.7-13.6$), based on greater dilution by the EDTA in the tube (about 70-75 microliters).**

Bar code labels

- ***1 on the tube;***
- ***1 on each of 4 copies of the doping control form.***
- ***1 on the plastic envelop of the sealed kit (used as absorbent prevention in case the sealed kit or tube go broken).***

NOTE: put the label on the tube before starting the blood collection (possible mistake: the tube is sealed in the kit without the label on).

Do not forget !!

- **Signature of the athlete on the form, before blood collection, for acceptance.**
- **Signature of phlebotomist/BCO on the form with date and time of blood collection.**
- **Signature of DCO (or BCO if the same) on blood sampling form.**
- **Final signature of the athlete, with date and time of end of procedures.**

3. INFORMATION FOR ANALYSIS • INFORMATIONS POUR L'ANALYSE

OUT OF COMPETITION HORS COMPÉTITION	<input type="checkbox"/>	PRE COMPETITION	<input type="checkbox"/>	IN COMPETITION EN COMPÉTITION	<input type="checkbox"/>		
DATE OF THE TEST DATE DU CONTRÔLE		DD / JJ		MM		YYYY / AAAA	
		LAST TRAINING • DERNIER ENTRAÎNEMENT		LAST FOOD INTAKE • DERNIÈRE PRISE ALIMENTAIRE			
BLOOD / SANG		<input type="checkbox"/> 1 tube <input type="checkbox"/> 2 tubes		BLOOD SAMPLE CODE NUMBER • NUMÉRO DE CODE D'ÉCHANTILLON DE SANG		TIME • HEURE	
						DECLARATION OF BLOOD TRANSFUSIONS : LIST ANY TRANSFUSIONS RECEIVED OVER THE LAST 6 MONTHS. DECLARATION DE TRANSFUSIONS SANGUINES : INDICER LES TRANSFUSIONS REÇUES AU COURS DES 6 DERNIERS MOIS.	

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SUPPLEMENTARY REPORT FORM ?
FORMULAIRE DE RAPPORT COMPLÉMENTAIRE ? ☐

I CERTIFY THAT I HAVE PROVIDED THE ATHLETE WITH EVIDENCE OF MY QUALIFICATION TO TAKE A BLOOD SAMPLE AND THAT THE BLOOD SAMPLE COLLECTION WAS CONDUCTED IN ACCORDANCE WITH THE RELEVANT IAAF REGULATIONS
J'ATTESTE AVOIR FOURNI LA PREUVE DE MA QUALIFICATION EN QUALITÉ D'AGENT DE PRÉLÈVEMENT SANGUIN ET PROCÉDÉ AU PRÉLÈVEMENT SANGUIN CONFORMÈMENT À LA RÉGLEMENTATION DE L'IAAF EN VIGUEUR

BLOOD COLLECTION OFFICER • AGENT DE PRÉLÈVEMENT SANGUIN

NAME / NOM

SIGNATURE

ATHLETE REPRESENTATIVE (IF APPROPRIATE) • REPRÉSENTANT DE L'ATHLÈTE (SI NÉCESSAIRE)

NAME / NOM

POSITION / FONCTION

SIGNATURE

DOPING CONTROL OFFICIAL (IF APPROPRIATE) • RESPONSABLE DU CONTRÔLE ANTIDOPAGE (SI NÉCESSAIRE)

NAME / NOM

SIGNATURE

DATE DD / JJ MM YYYY / AAAA

TIME OF COMPLETION • COMPLÉTÉ À (HEURES)

- I DECLARE THAT THE INFORMATION I HAVE GIVEN ON THIS DOCUMENT IS CORRECT.
- I DECLARE THAT, SUBJECT TO COMMENTS MADE IN SECTION 4, THE SAMPLE COLLECTION WAS CONDUCTED IN ACCORDANCE WITH THE RELEVANT PROCEDURES AND I DO NOT CONTEST ANY ASPECT OF THE SAMPLE COLLECTION.
- I ACCEPT THAT ALL INFORMATION RELATED TO THIS DOPING CONTROL, INCLUDING BUT NOT LIMITED TO LABORATORY RESULTS AND ANY EVENTUAL SANCTION MAY BE SHARED WITH RELEVANT BODIES IN ACCORDANCE WITH IAAF ANTI-DOPING RULES.
- I ACCEPT THAT ANY DISPUTE, CONTROVERSY OR CLAIM HOWSOEVER ARISING FROM THIS DOPING CONTROL SHALL BE RESOLVED IN ACCORDANCE WITH IAAF COMPETITION RULES.
- I ACCEPT THE COMPETENCE OF THE COURT OF ARBITRATION FOR SPORT IN LAUSANNE, SWITZERLAND TO RESOLVE DEFINITELY ANY SUCH DISPUTE, CONTROVERSY OR CLAIM EXCLUDING ALL RECOURSE TO ORDINARY COURTS.
- JE DÉCLARE QUE LES INFORMATIONS FOURNIES DANS CE DOCUMENT SONT EXACTES.
- JE DÉCLARE, SOUS RÉSERVE DES COMMENTAIRES INSCRITS À LA SECTION 4, QUE LE PRÉLÈVEMENT D'ÉCHANTILLONS S'EST DÉROULÉ DANS LE RESPECT DES PROCÉDURES APPLICABLES ET QUE JE N'ENTENDS PAS CONTESTER LA PROCÉDURE DE PRÉLÈVEMENT.
- JE CONSENS À CE QUE LES INFORMATIONS RELATIVES À CE CONTRÔLE ANTIDOPAGE, INCLUANT MAUSION LIMITEES AUX RESULTATS DE LABORATOIRE ET À TOUTE SANCTION ÉVENTUELLE, SOIENT COMMUNIQUÉES AUX ORGANISATIONS CONCERNÉES CONFORMÉMENT AUX RÈGLES ANTIDOPAGE DE L'IAAF.
- J'ACCEPTE QUE TOUT LITIGE, CONTROVERSE OU RÉCLAMATION RELATIF À CE CONTRÔLE ANTIDOPAGE SOIT RÉSOLU CONFORMÉMENT AUX RÈGLES DES COMPÉTITIONS DE L'IAAF.
- J'ACCEPTE LA COMPÉTENCE DU TRIBUNAL ARBITRAL DU SPORT BASÉ À LAUSANNE, SUISSE POUR LE RÈGLEMENT DÉFINITIF DE TELS LITIGES, CONTROVERSES OU RÉCLAMATIONS À L'EXCLUSION DE TOUT RECOURS AU TRIBUNAL DE DROIT COMMUN.

ATHLETE'S SIGNATURE
SIGNATURE DE L'ATHLÈTE



Storage and transport of collected blood samples

- ***a refrigerator***
- ***an insulated cool box***
- ***an isotherm bag***
- ***any other device that possesses the capabilities mentioned below.***

****** Maintain blood samples at a constant temperature between 4 (2) and 12° C (2-8° C WADA) during storage and transport. (>>>> 4-8°C is the best)***

****** Blood samples must not be allowed to freeze.***

****** Keep secure storage and transport conditions.***

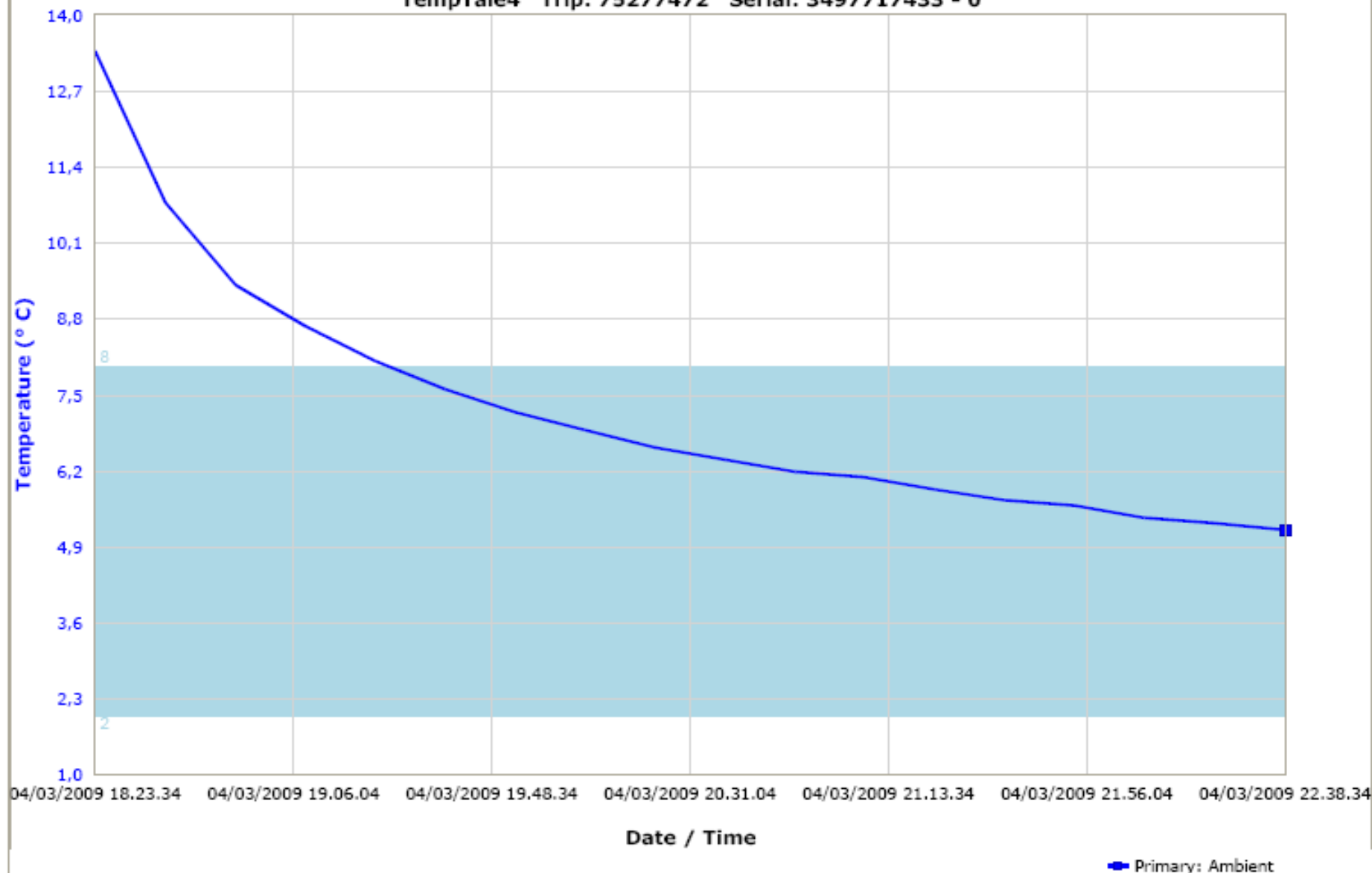
Temperature control during storage and transport

❖ **Easier during storage, while using a directly controlled location (refrigerator, isotherm bag, etc)**

❖ **More difficult during transport, usually less directly controlled, and subject to enviromental transport conditions: useful data logger.**

Data Logger





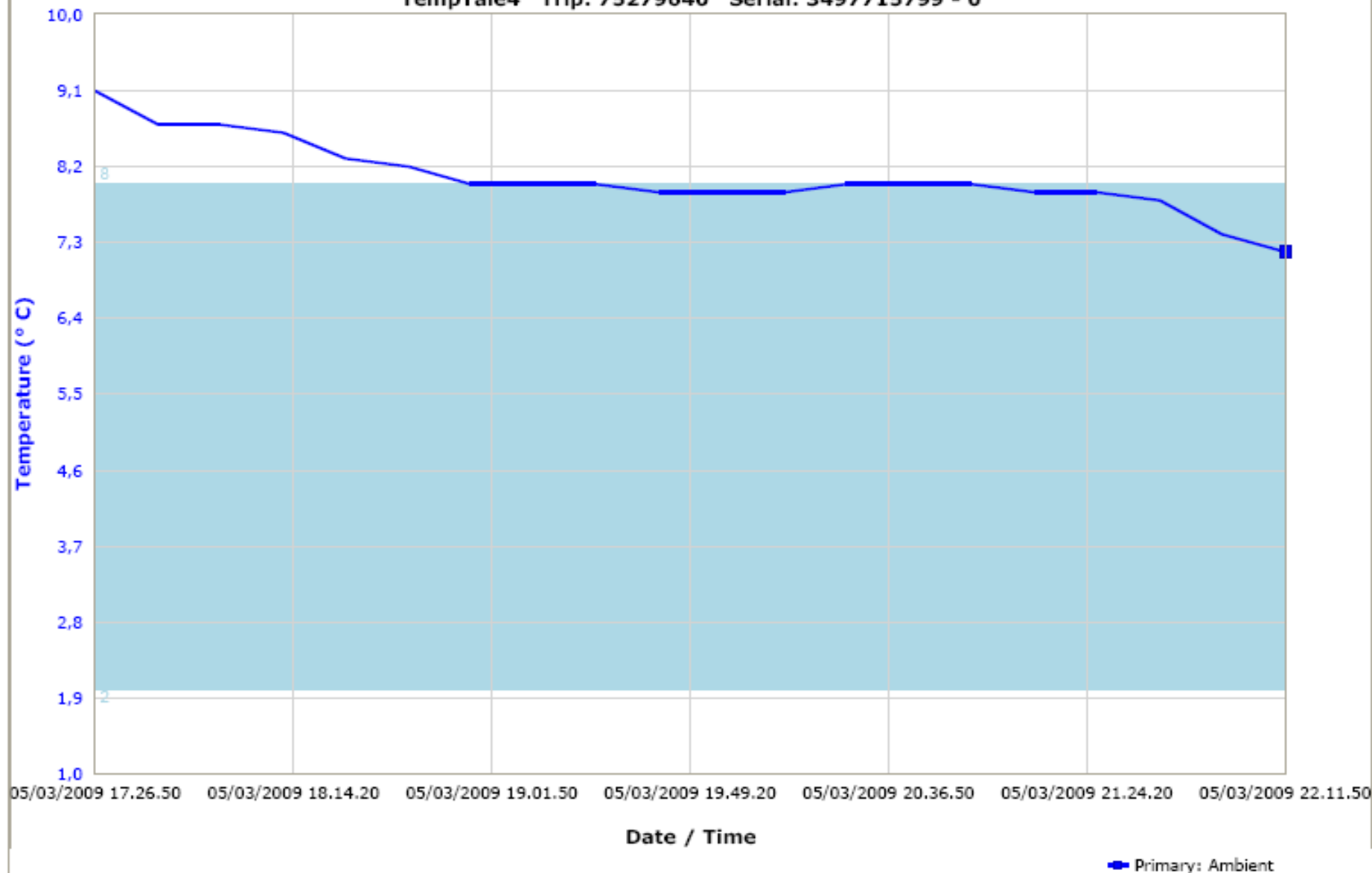
First Recorded Point: 04/03/2009 18.23.34

Last Recorded Point: 04/03/2009 22.38.34

Displaying: 18 points

Comments:

TempTale4 Trip: 75279640 Serial: 3497715799 - 0



First Recorded Point: 05/03/2009 17.26.50

Last Recorded Point: 05/03/2009 22.11.50

Displaying: 20 points

Comments:

Blood analytical protocol

- ***Appropriate labs: WADA accredited laboratories and/or diagnostic laboratories under the supervision of a WADA accredited laboratory.***
- ***Analysis two times consecutively of all internal quality controls (QC), before starting session.***
- ***Analysis of internal QC every 30-50 samples and at the end of session to demonstrate the stability of the instrument.***

Analysis of blood samples

- ***All blood samples must be homogenized for a minimum period of 15 minutes.***
- ***Each blood sample shall be analyzed twice.***
- ***Accepted difference:***
- ***0.1 g/dl for HGB analysis (e.g. 15.0 and 15.1 g/dl);***
- ***0.6% for HCT analysis (e.g. 45.0 % and 45.6 %);***
- ***0.15% for %Ret analysis if first measurement lower or equal to 1.00 % (e.g. 0.8 % and 0.95 %);***
- ***0.25% for %Ret analysis if first measurement higher than 1.00 % (e.g. 1.10 % and 1.35 %)***

Analysis of blood samples

- ***The first result is officially recorded.***
- ***The second data is considered as a confirmation.***
- ***If absolute differences between the results of the two analyses are greater than those defined above for a specific sample, the analysis shall be started again.***

Needed results

- **Where a blood sample is taken from an athlete for blood screening purposes, it shall be screened for a minimum of the following parameters:
Hct, Hgb, RBC, MCV, MCH, MCHC, %reticulocytes and #reticulocytes.**

Thresholds

	Hemoglobin (Hb) (g/dl)	Reticulocytes (%)	OFF-Score (Hb-60÷reticulocytes) Hb in g/l
Males	17,5	≥ 2 or ≤ 0.2	125,6
Females	16	≥ 2 or ≤ 0.2	113,5

- If a hemoglobin concentration and/or OFF-score is recorded as being in excess of the stipulated level or if the screening result confirms that an athlete has a % reticulocytes recorded as being outside of the stipulated range or if, for any other reason, the IAAF in its sole discretion so decides, a urine sample from the athlete in question shall be collected and analysed for the presence of banned substances including rh-EPO.***

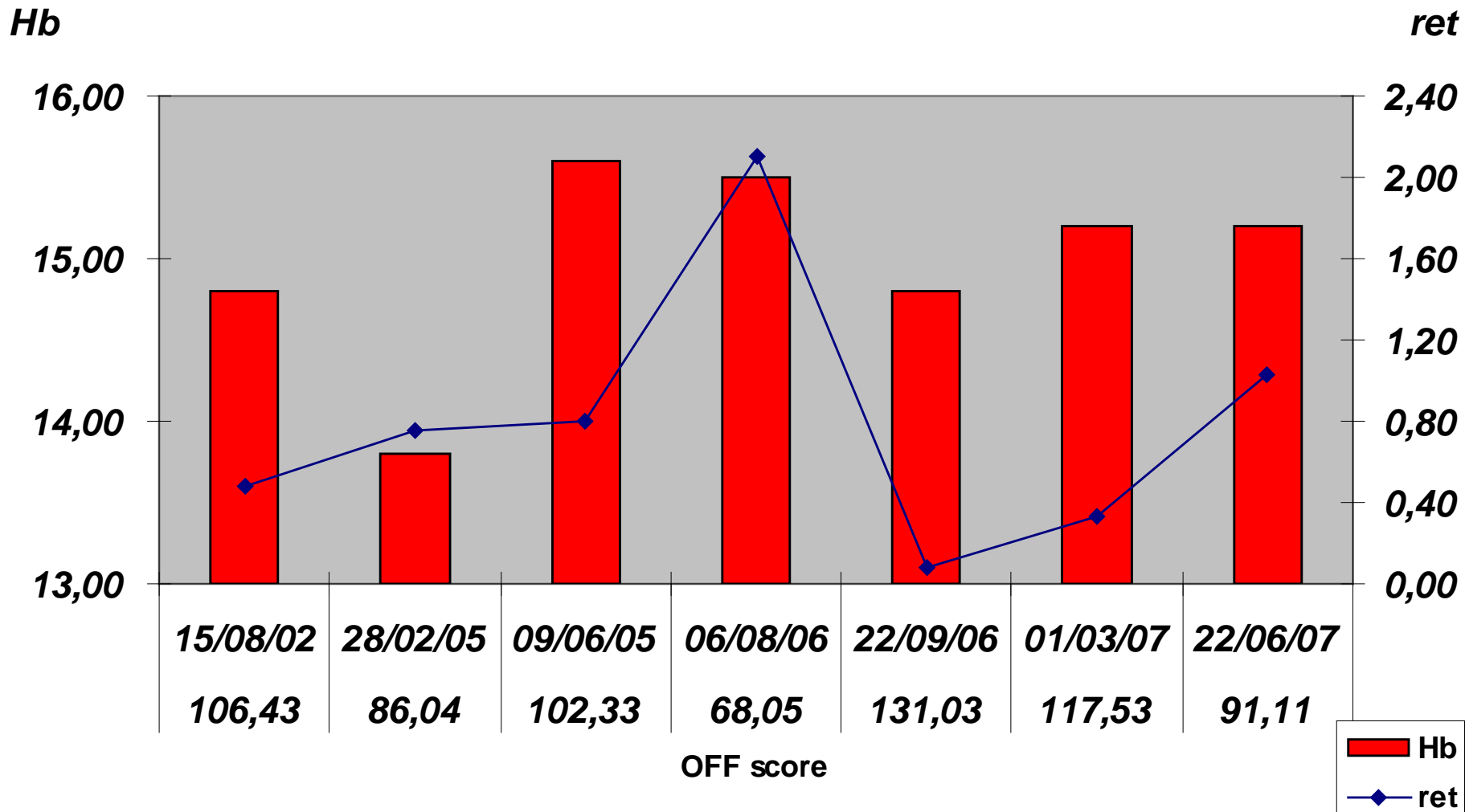
$$OFF_{Hr}\text{-score} = (Hb \times 10) - (60 \times \sqrt{ret})$$

(Gore CJ, Parisotto R, Ashenden MJ et al. Haematologica 2003, 88, 333-344)

	Males			Females		
	Typical at sea level	Worst-case at sea level	Worst-case at altitude	Typical at sea level	Worst-case at sea level	Worst-case at altitude
ON-hes						
1 in 10	184.5	192.2	209.4	169.9	174.6	187.6
1 in 100	195.6	203.3	220.5	181.6	186.3	199.3
1 in 1000	204.0	211.7	228.9	190.7	195.4	208.4
1 in 10000	211.2	218.9	236.1	198.8	203.5	216.5
ON-he						
1 in 10	185.4	191.4	207.1	170.7	175.0	187.6
1 in 100	195.3	201.3	217.1	181.0	185.3	197.9
1 in 1000	202.9	208.9	224.7	189.2	193.5	206.0
1 in 10000	209.5	215.5	231.2	196.5	200.8	213.3
OFF-hre						
1 in 10	94.8	99.6	108.1	80.2	86.8	94.1
1 in 100	106.0	110.5	118.3	91.5	97.4	104.1
1 in 1000	114.1	118.3	125.7	99.6	106.2	111.6
1 in 10000	120.8	124.8	132.0	106.5	111.8	117.9
OFF-hr						
1 in 10	100.1	104.6	113.7	86.1	92.2	99.9
1 in 100	112.4	116.7	125.3	98.7	104.4	111.7
1 in 1000	121.5	125.6	134.0	108.1	113.5	120.5
1 in 10000	129.2	133.2	141.3	116.1	121.4	128.1

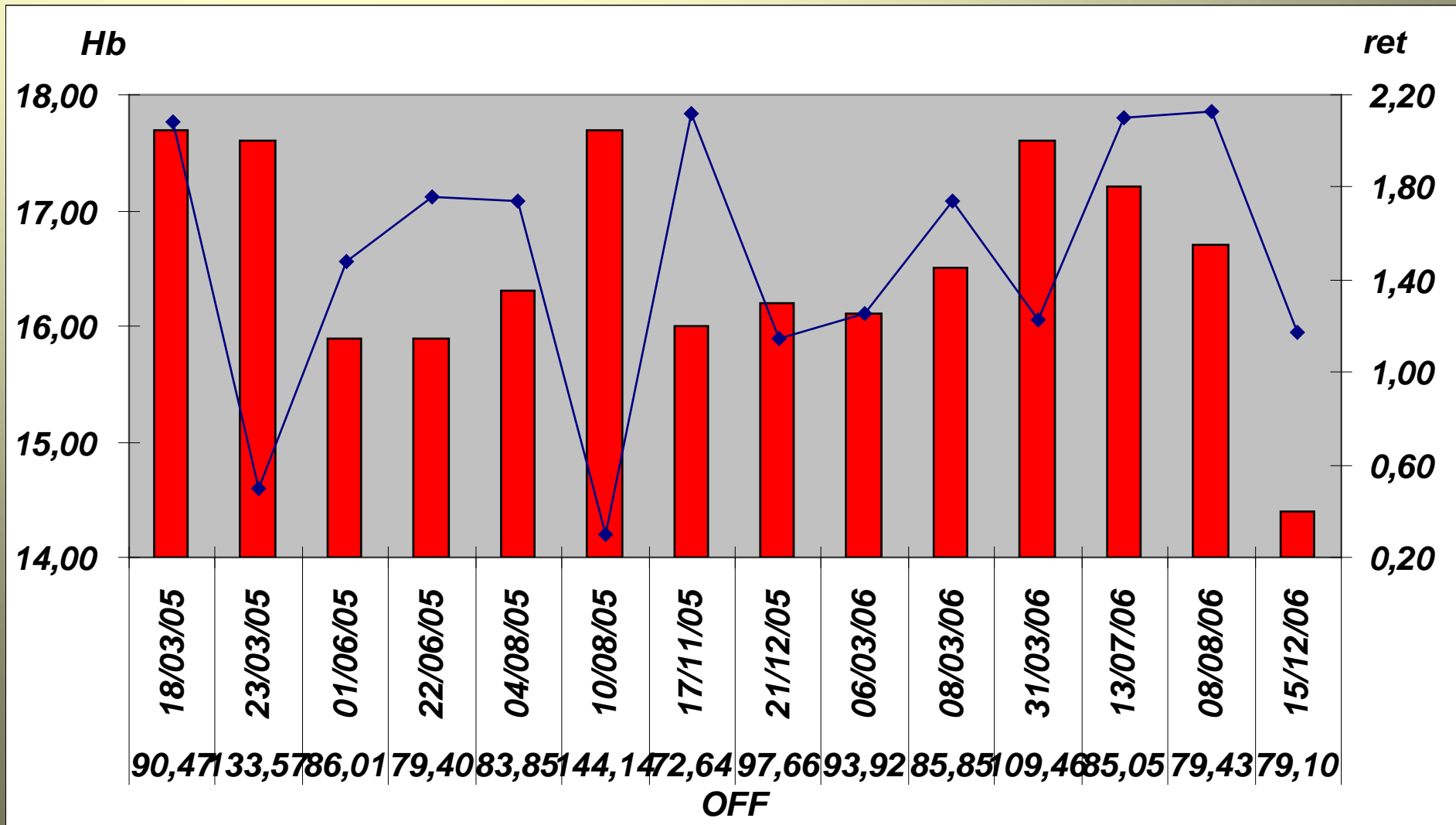
Target test based on blood screening

Athlete F1 (EPO+)



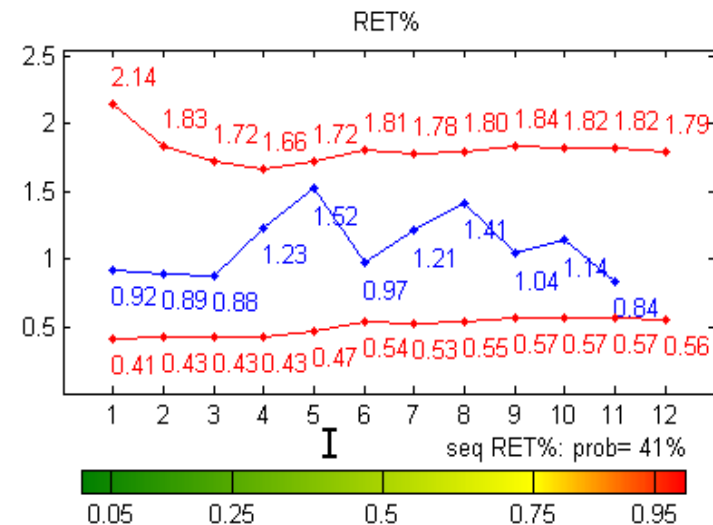
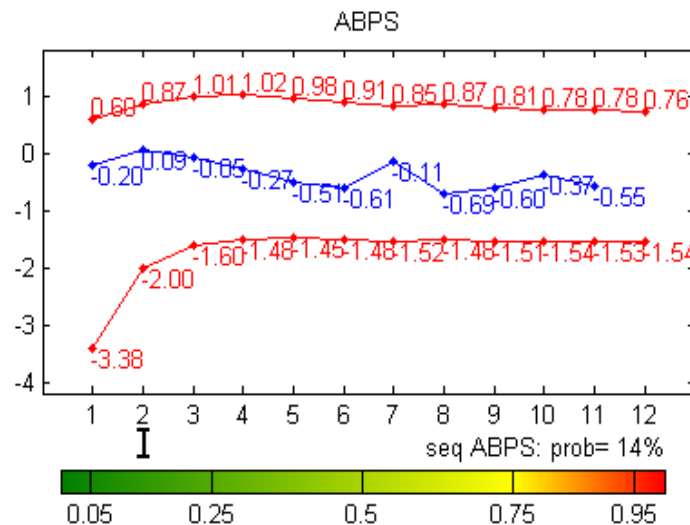
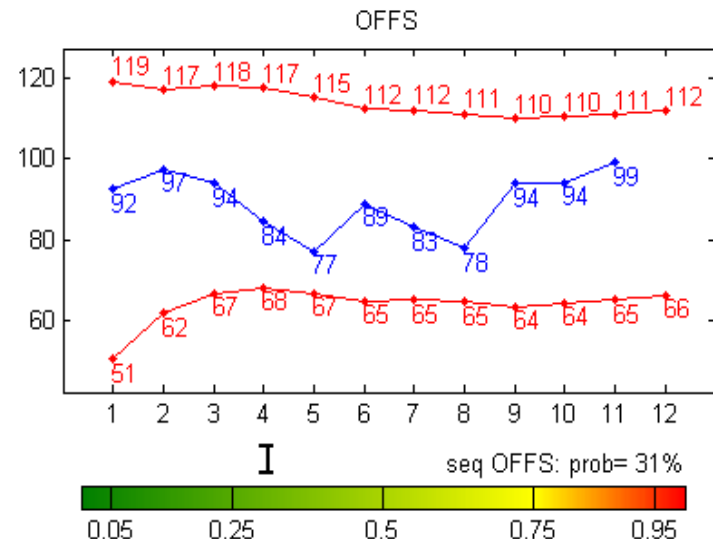
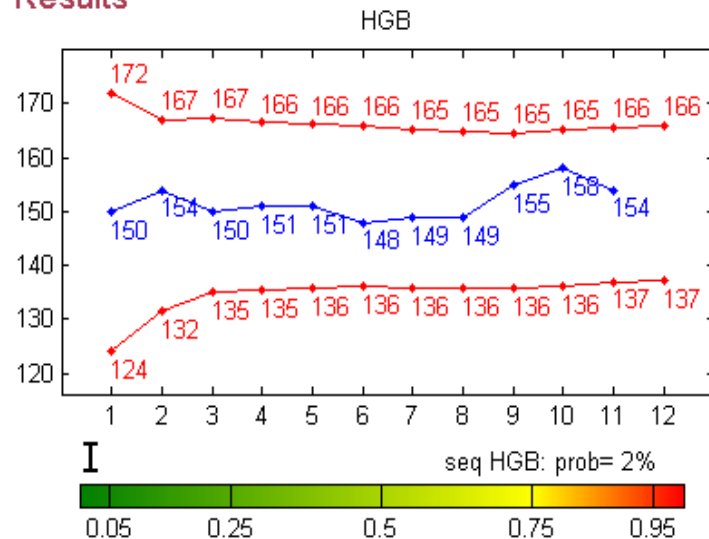
Target test based on blood screening

Athlete M2 (EPO+)



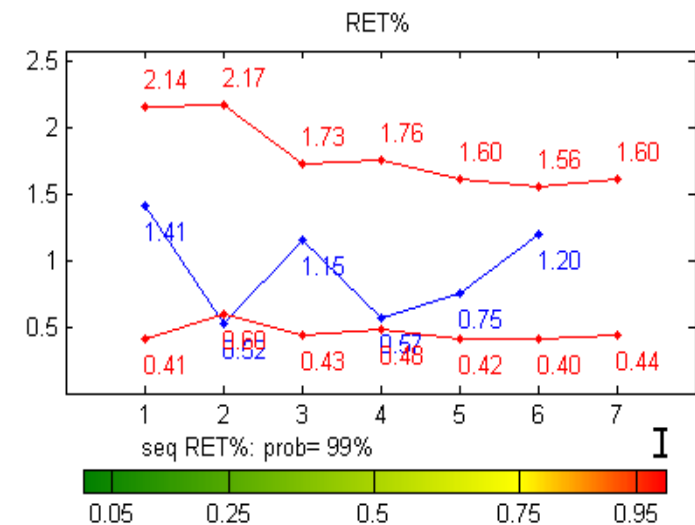
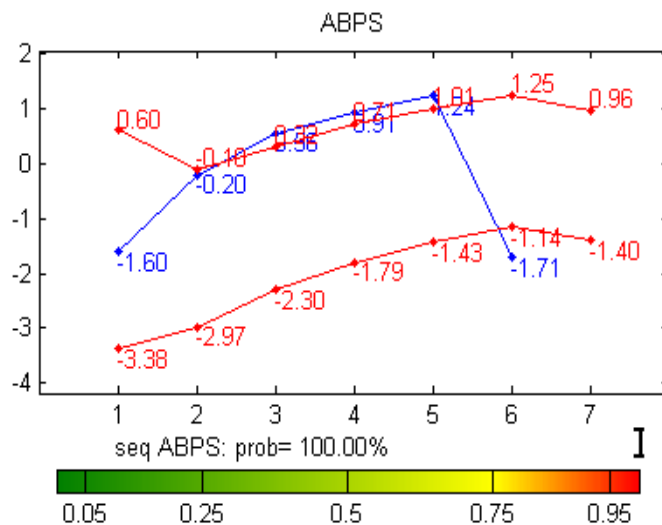
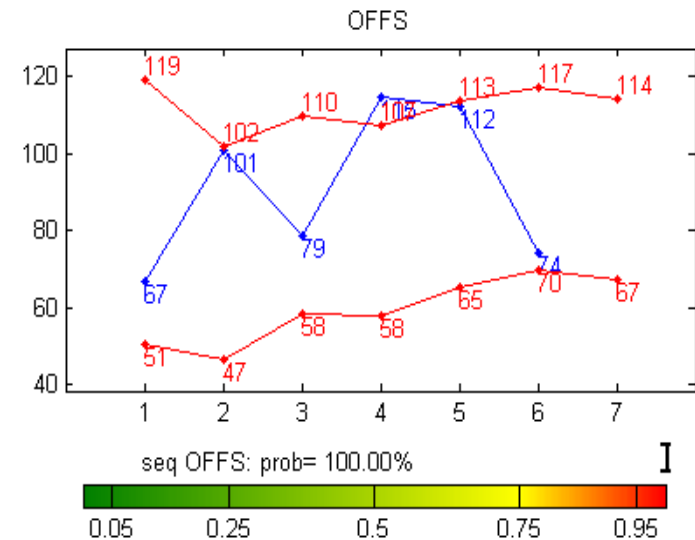
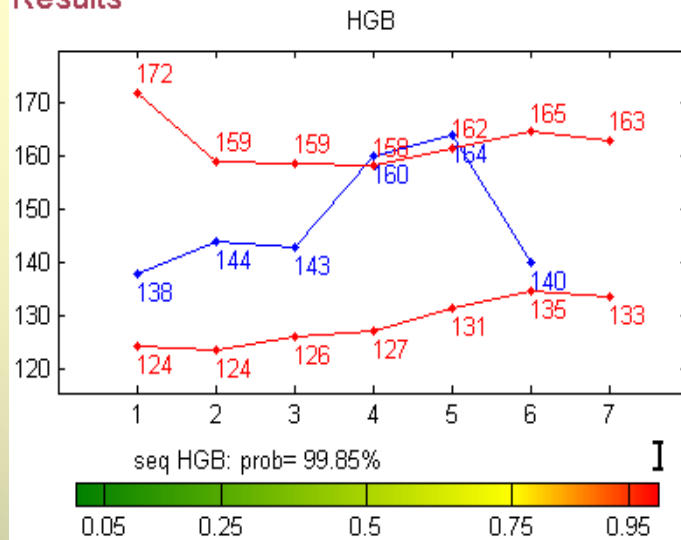
Athelete's Biological Passport (Lausanne Antidoping Lab. - P.E.Sottas)

Results



Athelete's Biological Passport (Lausanne Antidoping Lab. - P.E.Sottas)

Results



*Only a professional work on each step will
produce good and reliable final results*



Thanks for your patience