



AORC Guidelines

A Glossary of terms commonly used in Racing Chemistry

In addition to the normative references given in Clause 2 of ISO/IEC 17025:2017, the following is a collection of terms (in alphabetical order) commonly used by RACING CHEMISTS and which are specific to the discipline of RACING CHEMISTRY. This collection has been derived and updated from a draft Glossary of Terms produced by an *ad hoc* "ISO 17025 Accreditation Committee" of the Association of Official Racing Chemists (AORC). It is not intended to be comprehensive, nor does it provide an authoritative interpretation of terms the use of which does vary from one region to another.

Action Level

An in-house limit (usually applied during SCREENING and expressed as a concentration, but can also be just an instrument response or a relative concentration) below which a laboratory does not normally pursue the possible presence of a PROHIBITED SUBSTANCE.

[Also known as *Recommended Limit of Detection* (RLOD) or *Screening Limit of Detection* (SLOD) when applied to the detection of certain common equine therapeutic substances].

Administration Control

A portion of an ADMINISTRATION SAMPLE or an isolate therefrom, that is analysed concomitantly with the TEST SAMPLE for quality control purposes.

Administration Sample

A SAMPLE collected after the administration of a substance (usually a PROHIBITED SUBSTANCE) to a horse or some other species.

A-sample and B-sample

A SAMPLE collected under a secure chain of custody is normally split into an A-SAMPLE and a B-SAMPLE. The A-SAMPLE shall be the sole SAMPLE used for PRIMARY ANALYSIS. The B-SAMPLE may be analysed for substances identified and reported in the A-SAMPLE, either automatically or at the option of the trainer, owner, or Horseracing Authority.

[From Article 6A, Clause 3, of the *International Agreement on Breeding, Racing and Wagering* of the International Federation of Horseracing Authorities (IFHA); the A-SAMPLE may be referred to as a *Primary Sample* or *First Sample*, and the B-SAMPLE as a *Referee Sample*, *Reserved Sample*, *Confirmatory Sample*, *Split Sample*, or *Secondary Sample*.]

Biological Sample

A SAMPLE taken from any part of the horse or some other species.

Biomarker

A defined characteristic that is measured as an indicator of normal biological processes, pathogenic processes, or biological responses to an exposure or intervention, including therapeutic intervention.

[Taken from the FDA/NIH Biomarker Working Group]

Broad-spectrum Screening

A SCREENING procedure that can detect a broad variety of substances (mostly PROHIBITED SUBSTANCES).

Carryover

A process by which material from one TEST SAMPLE is transferred to the next through contact with a device used on both TEST SAMPLES, such as, for example, an injector port, pipette tip or injection needle.

[Also known as *Injector Memory* when the CARRYOVER occurs via the injector of an instrument].

Clear Days

CLEAR DAYS is a general concept of duration which excludes the day of treatment (drug administration or other practice) and the day of racing or official veterinary examination.

[E.g., a stand down period for intraarticular injections of 14 clear days from RACE DAY on 15 May would mean no intraarticular injection may be administered at any time within 1 May and 14 May]

Confirmatory Analysis or Confirmation

An analytical procedure applied to a SAMPLE to identify and establish the presence of a substance (usually a PROHIBITED SUBSTANCE).

[Also known as *Confirmatory Method* or *Confirmation Procedure*; it may be applied to any SAMPLE].

Detection Time

The period after an administration, or after the last of a repeated administration, of a substance (usually a recognised drug) to a number of subjects (usually horses but can be other animals or sometimes persons), within such period the substance or one of its metabolites may be detected by a laboratory test in SAMPLES (usually blood or urine) collected from at least one of the subjects, and at the end of such period detection is no longer possible for all subjects at a given detection limit.

[The DETECTION TIME is sometimes known as *Detection Period* or *Detection Window*, but it must be recognised as relating only to circumstances specific to the administration (such as the form, dose or dosing regimen of the substance administered, and the route of administration). The individual variability of the subject and the analytical method used for detection can also affect the DETECTION TIME]

Double-Blind Sample

An unrevealed SAMPLE for performance evaluation that may contain an unrevealed PROHIBITED SUBSTANCE.

Elective Testing

An analytical service provided for guidance before a competition, where, subject to the authority's conditions, a submitted SAMPLE is analysed by the laboratory for the PROHIBITED SUBSTANCES requested (usually limited to legitimate species-specific therapeutic substances).

False Negative

Failure to report the presence of a PROHIBITED SUBSTANCE in a SAMPLE, when in fact it is present, or present at a level exceeding the relevant THRESHOLD, and should have been detected and confirmed by the laboratory's validated method(s) and reported.

False Positive

The reporting of a PROHIBITED SUBSTANCE which is actually not present, or not present at a level exceeding the relevant THRESHOLD, in the SAMPLE analysed and should not have been reported.

Gene Doping

Any unauthorised process or treatment in respect of a subject (horse or some other species) involving (i) the use or administration of oligomers or polymers of nucleic acid, nucleic acid analogues, genetically modified cells and gene editing agents, or (ii) the insertion, deletion and/or replacement of DNA in the genome of the subject.

[For details, please refer to Article 6B of the *International Agreement on Breeding, Racing and Wagering* of the IFHA]

Heritable Genome

The genetic material of a horse or some other species transmissible from the parents to offspring.

Horseracing Laboratory

A laboratory that carries out RACING CHEMISTRY (in whole or in part) on official SAMPLES routinely for a horseracing authority.

Negative

This may mean one of the following:

- where the laboratory reports that, in accordance with established criteria, no substance in possible contravention of the rules has been found -- more appropriately referred to as a Laboratory Negative or Negative Finding; or
- where the controlling authority takes the regulatory view that no substance in contravention of the rules has been found -- more appropriately referred to as an Official Negative or a Negative Case.

Negative Control

A portion of a matrix similar to that of the TEST SAMPLE (and negative to the analyte in question) to which the complete analytical procedure is applied in order to demonstrate that the apparatus and reagents employed are free of the analyte.

[May also be referred to as *Matrix Blank* or *Sample Blank* when the analyte in question is not a THRESHOLD substance].

Negative Exchange Sample

A SAMPLE already determined as a *Laboratory Negative* that is exchanged with another laboratory for testing, as a quality assurance measure against FALSE NEGATIVE results.

Official Sample

A SAMPLE collected under a secure chain of custody for the purpose of doping control or other forms of regulatory monitoring.

Performance Specification

The minimum analytical capability, expressed as the concentration of a substance (usually a PROHIBITED SUBSTANCE) or its metabolite, required of the laboratory to detect exposure.

[Also known as *Minimum Required Performance Levels* (MRPL); these concentrations must not be construed as regulatory THRESHOLDS, SCREENING LIMITS or RESIDUE LIMITS.]

Positive

This may mean one of the following:

- where the laboratory establishes the presence of a substance (usually a PROHIBITED SUBSTANCE) -- more appropriately referred to as a Laboratory Positive or Positive Finding or Adverse Analytical Finding; or
- where the presence of the PROHIBITED SUBSTANCE is accepted as factual (and in contravention of the rules) by the controlling authority or an inquiry board and is not dismissed on appeal -- more appropriately referred to as an Official Positive or a Positive Case.

Positive Control

A reference material or test portion used for obtaining reference data or other quality control purposes (such as to monitor if a certain test procedure is working).

Primary Analysis

Analysis conducted on any OFFICIAL SAMPLE without prior information of the identity and/or concentration of any of its constituent(s). It is commonly known as A-SAMPLE analysis or *first analysis*. Unless in exceptional cases, PRIMARY ANALYSIS is conducted by a single laboratory on a single (split) portion of the OFFICIAL SAMPLE.

Prohibited Substance

A substance defined by a regulatory authority as one which is not permitted to be present in a SAMPLE and, where relevant, at a concentration above its THRESHOLD. PROHIBITED SUBSTANCES may include drugs, metabolites, artefacts, toxins, or other substances as defined by each authority. A PROHIBITED SUBSTANCE may be further classified into *prohibited at all times* or *prohibited only on RACE DAYS*.

[See also Article 6A, Clauses 10-11, of the *International Agreement on Breeding, Racing and Wagering* of the IFHA]

Race Day

The day in which a race is conducted, starting from 00:00:00 hr to including 23:59:59 hr of that day.

Racing Chemist

A scientist engaged directly or via an authorized laboratory by a racing or equestrian authority to assist the science or practice of RACING CHEMISTRY.

[From the AORC; also known as *Racing Analyst*]

Racing Chemistry

The discipline of finding and proving the presence or absence of substances in specimens, contrary to the rules of racing or equestrian events.

[From the AORC; an alternative definition could be the application of test methods and processes to provide evidentiary data for the identification, and if applicable quantification, of substances in SAMPLES contrary to the rules of racing and equestrian events.]

Random Testing, or Out-Of-Competition Testing (OOCT), or Horse-In-Training Testing, or Testing in Training

The testing of SAMPLES collected from horses while in training and other than on RACE DAYS.

[RANDOM TESTING may also mean the process of random selection of horses or riders for doping control testing, or random selection of specific tests as applied to a SAMPLE].

Reagent Blank

A non-biological test portion (i.e., an equivalent amount of a suitable solution or solvent in place of a TEST SAMPLE and free of the analyte in question) analysed concomitantly with the TEST SAMPLE to demonstrate the absence of contamination during analysis.

Referee analysis

An independent analysis conducted on a split or remaining portion of the OFFICIAL SAMPLE to establish the presence, and if relevant quantify the concentration, of the reported PROHIBITED SUBSTANCE(S) and confirm whether or not the reported findings from the PRIMARY ANALYSIS are correct. It is commonly known as B-SAMPLE analysis, split-sample analysis, or counter analysis. REFEREE ANALYSIS is not a *de novo* analysis requiring SCREENING and CONFIRMATORY ANALYSIS for unnamed PROHIBITED SUBSTANCES.

Reporting Level

The concentration, as instructed by the authority or determined by the laboratory in consultation with the authority, of a specified PROHIBITED SUBSTANCE (usually a legitimate equine therapeutic substance or a naturally occurring substance) below which a laboratory does not normally report its presence in a SAMPLE.

[Also known as *Regulatory Level* or *Recommended Limit of Reporting* (RLOR)].

Residue Limit

The urine or plasma concentration adopted for the SCREENING of a certain feed contaminant or environmental substance, which by its nature is a PROHIBITED SUBSTANCE. It is a harmonised detection limit agreed and selectively adopted by a racing authority, and is conveyed by instruction from the authority to their laboratories. Similar to SCREENING LIMIT, RESIDUE LIMIT is not a THRESHOLD. When the screening procedure indicates that the RESIDUE LIMIT has been exceeded, all that is required is qualitative CONFIRMATORY ANALYSIS to confirm the presence or absence of the PROHIBITED SUBSTANCE. Quantification is not required.

[For more information, see: <https://www.ifhaonline.org/Default.asp?section=IABRW&area=18>]

Sample

Material from any part, or in contact with any part, of the horse or some other species.

[See Article 6A, Clause 2, of the *International Agreement on Breeding, Racing and Wagering* of the IFHA for SAMPLE from horses]

Screening

An analytical procedure applied to a TEST SAMPLE or series of TEST SAMPLES designed to differentiate between those that do not warrant further investigation and any that shows preliminary evidence of the possible presence of a PROHIBITED SUBSTANCE (and where relevant at a level that possibly exceeds its THRESHOLD, SCREENING LIMIT or RESIDUE LIMIT) and requires follow-up or CONFIRMATORY ANALYSIS.

[Also known as *Initial Testing Procedure*]

Screening Limit

The urine or blood (normally plasma) concentration adopted for the SCREENING of a specified therapeutic PROHIBITED SUBSTANCE. It is a harmonised detection limit agreed and selectively adopted by a racing authority, and is conveyed by instruction from the authority to their laboratories. SCREENING LIMIT is not a THRESHOLD. When the screening procedure indicates that the SCREENING LIMIT has been exceeded, all that is required is qualitative CONFIRMATORY ANALYSIS to confirm the presence or absence of the PROHIBITED SUBSTANCE. Quantification is not required.

[More information can be found in <https://www.ifhaonline.org/Default.asp?section=IABRW&area=1> and <https://www.ifhaonline.org/Default.asp?section=IABRW&area=6>]

Single-Blind Sample

A SAMPLE revealed to be for performance evaluation where the identity of the PROHIBITED SUBSTANCE present or its concentration, or frequently both, are not revealed.

Spiked Sample or Spiked Control

A SAMPLE to which a quantity of a substance (usually a PROHIBITED SUBSTANCE) has been added, usually with knowledge of the resulting concentration, and is used for quality control purposes.

Suspicious or Suspect

There is evidence from one or more tests for the presence of a substance (usually a PROHIBITED SUBSTANCE), but it does not meet the criteria for identification and suggests additional testing may be required.

[May also be referred to as *Irregular* or *Atypical*; results from SCREENING should never be referred to as POSITIVE.]

System Blank

A REAGENT BLANK or NEGATIVE CONTROL analysed concomitantly with the TEST SAMPLE to demonstrate the absence of contamination during analysis.

Target Screening

A SCREENING procedure that targets a specific substance or a specific group of substances (usually PROHIBITED SUBSTANCES).

[Also known as *Specific Screening*]

Test Sample or Sample Aliquot

A portion or aliquot taken from a SAMPLE and which may have been processed or subject to certain analytical procedures.

Threshold

An internationally or regionally agreed regulatory limit expressed as a numerical value (usually the concentration of a specified substance) or some other indicator (such as a concentration ratio, or difference between the quantities, of two specified substances) in a specified matrix (e.g. blood or urine), below which the finding is not actionable (i.e., *Official Negative*).

[A substance below its THRESHOLD is not a PROHIBITED SUBSTANCE. THRESHOLDS can only be adopted for (i) substances endogenous to the horse and (ii) substances arising from plants traditionally grazed or harvested as equine feed -- from Article 6A, Clauses 14-17, of the *International Agreement on Breeding, Racing and Wagering* of the IFHA]

Withdrawal Time or Withdrawal Period

The period after an administration, or after the last of a repeated administration, for which the substance (usually a legitimate equine therapeutic substance) or its metabolites can be found in BIOLOGICAL SAMPLES collected in a given percentile of the population (e.g. 80, 90, 95%) with a given statistical protection (confidence limit). The WITHDRAWAL TIME should be longer than the corresponding DETECTION TIME to take into account the impacts of animal variability (e.g. age, sex, breed, training, and racing) and treatment variability.

[In practice, the WITHDRAWAL TIME is a professional advice, determined normally by the treating veterinarian and given to the trainer or owner, on the appropriate withholding time from racing after a treatment (or a series of treatments) to the animal in order to avoid the risk of the animal returning a positive test on RACE DAY.]

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