GUIDELINES FOR CLASSIFICATION OF PROHIBITED SUBSTANCES

CLASSIFICATION OF PROHIBITED SUBSTANCES IN SPECIMENS COLLECTED ON RACE DAY (PRE- AND POST-RACE)

Preamble

This classification document is intended as a guideline to assist in understanding the severity and implications of alleged prohibited substance (drug) offences, and it can serve as a guide to assist in respect of associated penalties. In this regard there is a Prohibited Substance List provided, with a classification for each substance in relation to the severity of such a finding, with additional sections in clarification of specific prohibited substances.

It is important to stress that other aspects (than classification) can significantly contribute to the severity of the offence and the associated penalty. These include the route of administration of the drug preparation (for instance oral versus injection), illegal sourcing of this preparation, the intent to manipulate the race result, risk to the rider, the welfare of the horse, a prohibited practice which could be involved, evidence that the medication(s) / substance(s) may have been used improperly, and previous offences.

During such investigation (which could be a discussion, as consultation or a formal inquiry) there may be an investigation into aspects surrounding the administration of a drug to the horse as well as the veterinary and pharmacological aspects of the finding. It is important to note that for a particular substance, different findings may present very different facts and aspects to consider. There may also be mitigating circumstances which must be investigated and considered. These could affect the outcome of the inquiry (or associated Admission of Guilt (AOG) being decided on) and the penalty, irrespective of the particular substance and the associated classification. Previous prohibited substances offences (considering the classification of the prohibited substances and the number of such involved) could certainly affect the penalty of a finding.

The Prohibited Substance List provides for a range of substances administered to racehorses

- Included are locally registered veterinary preparations and local human preparations which registered veterinarians may use as an off-label application, when deemed necessary. The practice of off-label use (in a manner not exactly indicated on the product label) of locally registered human preparations in the veterinary (equine) field is allowed by the SA Veterinary Council and the NHA. This contrasts with the illegal use of preparations which are

not registered or not licensed locally, substances which are illegally sourced (Class 1, Forbidden Substances. NHA Rules) and human recreational drugs of abuse (Class 1, Forbidden Substances, NHA Rules).

- Note that a product is also considered as "illegal and illegally sourced" if it is preparation which contains (or claims to contain) a prohibited or forbidden substance(s) which is obtained via electronic payment via mail / courier delivery, from either a local or overseas dispatch location, without a local veterinary prescription being in place from a local veterinarian.
- Drugs that are illegally sourced, that have a pronounced effect on the horse, and which are clearly not intended for use in the horse are placed in higher classes. This particularly if these might affect the performance of the horse and the outcome of a race. Such findings may be forwarded to the relevant veterinary, medication control and law enforcement bodies and authorities for further investigation.
- Compounded veterinary pharmaceuticals are preparations which are specially manufactured on prescription in compounding pharmacies to create a particular product for a particular need. The preparation is often a close copy of an existing or discontinued product. Such products can legitimately be used on horses as indicated, when it is formally prescribed for a specific horse.
- Veterinarians may use compounded medications when a particular medicine is unavailable or is in an undesirable dosage form. These medications are considered prescription only medications and are patient specific. The supply is limited to 30 days' worth of use and has legal shelf life (expiry) of strictly 30 days. Therefore, all compounded medication not used within 30 days of prescription, must be appropriately disposed of, and should not be relabeled (refer to the NHA Equine Health and Welfare website). Commonly compounded medication for use in equine veterinary practice include injectable Ammonium chloride, Altrenogest, Flumethasone and various oral pastes which include Acepromazine, Flunixin meglumine, Omeprazole and Pergolide.
- There are a variety of prohibited substance containing preparations which are readily available in shops and pharmacy shopfronts. These are often not scheduled or otherwise have a schedule (such as schedule 0, 1 and 2) which does not require a prescription. These substances are discussed in this document.
- Where a particular substance is found to be a feed or environmental contaminant, the specific pharmacological classification of the substance may be of less relevance than the issue of the contamination.

The class (classification) ranking of substances

The ranking of the substances (shown in the Prohibited Substance List) within the indicated classes is based on aspects such as the pharmacological effect, the considered ability to influence the outcome of a race and whether these have a legitimate therapeutic use in the racehorse. Drugs clearly intended for use in equine therapeutics and those unlikely to affect race performance occupy lower classes. Many of the substances / drugs have numerous effects

and side effects and this must be considered within the classification. This substance classification will be reviewed regularly, and new substances will be added or removed when deemed appropriate. The welfare concerns (and public perception) when certain prohibited substances are used in contravention of the Rules of the NHA, may significantly affect the penalty of such findings.

The pro-drugs and the metabolites of substances

Note that the list of substances does not include all the metabolites of all the listed prohibited substances covered by the listed drug groupings. Some of the listed substances are precursors of prohibited substances (pro-drugs which are often steroid esters) and these are also considered prohibited substances. Where both a substance and its metabolite(s) are reported (or similarly both a substance and its pro-drugs), these are considered singular findings. Such metabolites and pro-drugs adopt the classification corresponding to the corresponding prohibited substance.

Screening limits, Residue limits and International Thresholds

International Screening Limits (ISLs) are International Federation of Horseracing Authorities (IFHA) agreed and formalized urine or plasma concentration prosecution action levels which apply to a limited list of specified therapeutic (legitimate horse treatment) prohibited substances. There are some such similar therapeutic prohibited substance action levels which are decided on by the Asian Racing Federation and these are called Asian Screening Limits (ASLs).
Similarly, there are IFHA action levels to control certain substances which are contaminants and environmental substances (residues) which could be present in the feed of the horse or its environment, which are called International Residue Limits (IRLs).
For a given substance there is sometimes not both urine and plasma SL's but only one of the two. This is because SL's are only formalized once there is enough data to support the SL (within the International Federation of Horseracing Authorities / Asian Racing Federation). Typically there is more such trial data available from horse urine than from horse plasma. Additional international research is constantly being conducted and additional screening limits are expected to be added to the existing lists over time. The NHA is a signatory to selected International SLs.

- The current list of ISLs, ASLs and IRLs which are adopted by the NHA is shown on the NHA website (Laboratory section).

International (IFHA) Thresholds are in place for substances which could be endogenous to the horse, substances arising from plants traditionally grazed or harvested as equine feed or substances in equine feed arising from contamination during cultivation, processing or treatment, storage, or transportation. Many of these substances are to some level present in all horses.

- The current list of Thresholds, enforced by the NHA Rules, which are adopted by the NHA is shown on the NHA website (Laboratory section).

With International Thresholds the prosecution of substances requires the quantification of the substance in the relevant specimen to obtain an accurate quantity, which is reported to exceed the threshold value.
This contrasts with the international IFHA policy on substances with ISLs, ASLs and IRLs. With the prosecution of substances with such limits there is only the requirement that the NHA Laboratory has internal data evidence that these limits are being exceeded in the relevant specimen.

Therapeutic substance detection times

- A document as a Detection Time Guideline for Therapeutic Substances is published on the NHA website (Laboratory section).

This therapeutic substance guidance is an attempt to assist veterinarians involved in equine veterinary practice. The intention is to help ensure the best possible treatment for different injury or illness conditions experienced by racehorses.

The "Detection Times" are presented for some of the more commonly used therapeutic substances in equine medicine. The detection times within the document correspond to the International SL's adopted by the NHA for the control of therapeutic substances.
Please note in this Detection Time Guideline the difference between a Detection Time and a Withdrawal Time (which is the Detection Time with an additional safety timing), as applied to the therapeutic substance (drug substance).

The availability of drug preparations without prescription in shops and pharmacy shopfronts

There are a variety of prohibited substance containing preparations that are readily available in retail shops. These are often not scheduled at all or have only a S0, S1 or S2 medication schedule which do not require a prescription. A list is provided in this document but is not an exhaustive list of such local substances (local preparations) which are prohibited substances on which positive findings can be declared. This is stated as new preparations may appear and become commercially available over time. Any substance not included in this list that forms part of a local registered preparation will be classified according to its drug grouping. These shopfront S0, S1 or S2 medications most frequently contain anti-inflammatory (pain treatment) drugs and are often bandages, patches, gels, ointments, liniments or tablets.

These are discussed within the following sections of this document:

- V. Notes on easily accessible preparations in shops (without prescription)

- VI. Notes on over the counter and shop front anti-inflammatory drugs (without prescription)
- VII. Notes on Tetrahydrocannabinol (THC), Cannabidiol and Cannabidiolic acid originating from Cannabis plants

Vitamin B12 preparations containing Cobalt

Part of the vitamin B12 molecule is the element Cobalt, which is IFHA defined as a prohibited substance. This implies that the timing of the administration of this vitamin, and the dose administered, needs to be considered in relation to the timing of racing. Vitamin B12 and other sources of cobalt (such as supplements, tonics and fortified feeds) are discussed in a separate section of this document:

- XIV. Notes on Cobalt (contained in Vitamin B12 and supplements)

Beta-2 agonist drugs

Beta-2 agonists which form part of legitimate veterinary preparations, require special discussion. These are Forbidden Substances (Class 1) as these are ”Anabolic agents”. Two of these substances (Clenbuterol and Salbutamol) however also form part of legitimate veterinary treatments if these are formally prescribed and issued for the treatment of a NHA particular (veterinarian diagnosed) horse (refer to the NHA website, Equine Health and Welfare Section). Note that with Clenbuterol there is a specific procedure to be followed when a veterinarian prescribes, administer and dispense this medication for a particular horse. These two substances and their classification are discussed in separate sections:

- I. Notes on Clenbuterol
- II. Notes on Salbutamol (as contained in inhalers)

If a horse specimen is confirmed to contain one of these substances and there is no veterinary prescription in place for this horse, then this finding will be considered Class 1. In contrast, if a veterinary diagnosis, prescription and correctly labeled medication is in place for this specific horse according to the international and NHA requirement, then the inquiry may consider prosecuting this as a finding of a class less severe than Class 1.

Preparations which contain multiple drug (prohibited) substances

It must be noted that some preparations contain several prohibited substances (such as Buscopan which contains both N-butylscopolamine and Dipyrone). If a withdrawal period is considered for such preparation, then the period of detection of the most long-lasting substance in this medication must be considered.
Care must for example be taken with the administration of combination preparations such as Procaine Penicillin. While the penicillin is an antibiotic and not a prohibited substance, the Procaine is a prohibited substance while contained in this long-acting formulation. Procaine Penicillin is discussed in the separate section:

- III. Notes on Procaine (as contained in Procaine Penicillin)

All bisphosphonates soon to be banned in their use

Bisphosphonates are prohibited drug substances which may find application in the treatment of bone density loss. There is the current allowance that the local veterinary bisphosphonate drug Tiludronic acid may however be administered to the racehorse under specific conditions under the care of a veterinarian, as discussed in the separate section.

However, The International Federation of Horseracing Authorities (IFHA) advised that, from 1 January 2027 there will be a total ban on bisphosphonates (BPs) administration to racehorses. Horses treated with bisphosphonates on or after 1 January 2027 will be subject to a minimum six-month ban from racing.

This ban in the use of bisphosphonates in racehorses at any time is due to significant IFHA welfare-related concerns associated with the use of BPs, including BP-induced interference to bone adaptation and remodeling in growing and exercising horses (potentially resulting in an increased risk of fracture), and evidence that BPs have an analgesic effect (and may be used/abused for this effect).

- XII. Notes and conditions on the use of Tiludronic acid (a Bisphosphonate).

Notes on substances which can elevate the total Carbon Dioxide level of the blood

It will be noted that while Carbon Dioxide is a natural substance, there is an international Threshold value for total Carbon Dioxide exceeding which a prohibited substance finding is declared. The administration of products and preparations which contain bicarbonate and other alkalization agents could have the result of increasing the total Carbon Dioxide level of the blood and could result in this Threshold being exceeded on race day (during pre-race TCO2 blood testing). This is discussed in the section:

- X. Notes on substances that elevate the total Carbon Dioxide level of the blood

Non-local preparations, drugs and other substances

As previously note Preparations, drugs and substances (which are prohibited) not included in this list and those which are not registered for use in this country will be considered Class 1 violations (Class 1, Forbidden Substances according to the NHA Rules) unless information is presented to justify reclassification. It is again emphasized that a product is considered as "illegal and illegally sourced" if it is preparation which contains (or claims to contain) a prohibited or forbidden substance(s) which is obtained via electronic payment via mail / delivery / courier delivery, from either a local or overseas dispatch location, without a local veterinary prescription being in place from a local veterinarian.

Forbidden Substances

These are substances considered by the International Federation of Horseracing Authorities to be "prohibited substances which are not to be administered to racehorses at any time during their racing career". These are Class 1 substances.

- The current guidance to NHA Forbidden Substances is provided within the Rules of the NHA (Appendix M).

Note that there are different classes or Forbidden Substances, with a differing severity of ban, as detailed in the Rules of the NHA:

Anabolic agents: anabolic androgenic steroids

- ✓ Testosterone and its esters (prodrugs)
- ✓ Nandrolone and its esters (prodrugs)
- ✓ Boldenone and its esters (prodrugs)
- ✓ Synthetic anabolic structure steroids and such esters (prodrugs)

Any horse known to have been administered a FORBIDDEN SUBSTANCE, or if a specimen taken from that horse contains a FORBIDDEN SUBSTANCE (anabolic androgenic steroid) or exceeds the threshold for this substance, shall be banned from racing for a period of 365 days.

Other anabolic agents: by name beta-2 agonists,
(unless the substance is prescribed by a veterinarian as a bronchodilator at the appropriate dose and is reflected in the treatment record of the horse)

Any horse known to have been administered a FORBIDDEN SUBSTANCE, or if a specimen taken from that horse contains a FORBIDDEN SUBSTANCE (other than an anabolic steroid) or exceeds the threshold for this substance, shall be banned from racing for a period of 180 DAYS.

- ✓ Clenbuterol
- ✓ Salbutamol (alternative name Albuterol)
- ✓ Zilpaterol
- ✓ Ractopamine etc.

Note discussion of such substances and their classification in the separate sections:

- I. Notes on Clenbuterol
- II. Notes on Salbutamol (as contained in inhalers)

Forbidden Substances: Notes on human recreational drugs of abuse.

The NHA Rules detail ….
Forbidden Substances: Human Recreational Drugs of Abuse

The NHA Classification of Prohibited Substances details these as Class 1: Substances which have no place in horseracing, including illegal or Forbidden Substances ….
…. human recreational drugs of abuse ....

The screening of human recreational drugs of abuse is conducted close with a zero-tolerance threshold. The intention is to identify and investigate why the racehorse was exposed to such a Class 1 substance… which are illegally sourced… which are not to be administered to a horse at any time….. and which has no current approval by any government regulatory authority for veterinary use, not recognised by veterinary regulatory authorities as a valid veterinary therapeutic treatment.

Within international racing there is an awareness that such human drugs are used by human drug users up to very high doses and high concentration. In this regard it is possible that horse and horse specimens could test positive of these substances due to exposure to such human individuals. Investigation into the likelihood of such is possible during the confirmed drug positive finding inquiry process.

Horse feed contamination

During the past few years, 2 cases of horse feed contamination were identified by the NHA. The first was Caffeine, and the second of Zilpaterol, as detailed with NHA notices and press releases. The penalties for positive confirmatory analysis finding which could be correlated to these 2 feed contamination occurrences were adjusted accordingly. Evidence of such feed contamination could present itself as:

- Many horse specimen findings of the same substance within a short period of time, at somewhat similar levels.
- Many horse specimen findings with a commonality in the origin, supplier and/or feed batches ingested.
- Relevant feed supplier(s) batches being independently tested and confirmed to contain this substance as an about corresponding contamination level.

Note discussion on such a historic contaminant in the separate section:

- XV… Notes on Zilpaterol

Exempted Substances

The classification does not include those substances which would seem not to affect the performance of the horse, and these will be published within the most recent Rules of the NHA. This could include substances / drugs preparations such as:

1. Antibiotics / Antimicrobials (with the exception of procaine penicillin).

2. Anti-parasitic medication approved and registered for use in horses.

3. Anti-viral medication approved and registered for use in horses.

4. Anti-fungal medication approved and registered for use in horses.

5. Anti-ulcer medication approved and registered for use in horses.

   Treating gastric ulcers in horse often involves administering Omeprazole, a medication of various formulations that decreases acid production by the stomach. Due to aspects such as "Omeprazole resistance", the proper comprehensive treatment of equine gastric ulcer syndrome (EGUS) and equine glandular gastric disease (EGGD) may however require a combination of treatments with Omeprazole, Misoprostol (another drug which reduces acid production) and Sucralfate (a gastro protective drug). All these anti-ulcer medications are therefore exempted substances.

6. Registered vaccines against infectious agents in horses.

7. Glucosamine and chondroitin sulphate.

8. Locally registered oestrus suppressant medications in the female horse.

   Please be aware of the following NHA notice which was issued during November 2023:

   NHA analysis of a locally sourced Altrenogest-containing product has revealed trace levels of Trendione and Trenbolone (anabolic steroids which are forbidden substances) within the product. This corresponds to similar findings at overseas racing jurisdictions. Trendione and Trenbolone are not allowed to be present in any horse at any time under the IFHA and NHA Rules of Racing. The NHA strongly advises trainers against the use of Altrenogest-containing products, including compounded products, or those intended for use in other species.

- These substances are defined and listed as "Exempted Substances" within the Rules of the NHA, Appendix N.

With these substances being exempted it is confirmed that these antibiotics, antimicrobials, anti-parasitic anti-viral medication and anti-fungal drugs and substances are not prohibited substances. It must be noted that it is assumed that veterinarians prescribe and administer antibiotics and antimicrobials responsibly, considering that antimicrobial resistance is a concern with incorrect use.

Authorized Race Day Substances

These substances / preparations may be administered to the horse on race day, and these will be published within the most recent Rules of the NHA. None of the substances are prohibited substances. It must be considered that some of such preparations may elevate TCO2 levels of blood pre-race.

- These "Authorised Race Day Substances" are listed in the Rules of the NHA, Appendix O.

CLASSIFICATION OF PROHIBITED SUBSTANCES IN SPECIMENS COLLECTED OUT OF COMPETITION

The classification and penalties associated with Class 1 and Class 2 and Forbidden Substances apply equally during out of competition and on race day.
For therapeutic substances in Classes 3, 4 and 5 which are prosecuted to be present during out of competition testing (or exceeding an International Threshold) the n injury or guide is a penalty of 20% either side of the lowest scale on the table of the penalties corresponding to race day findings.

Note however that for out of competition specimens the guidelines for prohibited substances in classes 3, 4 and 5 do not apply to those therapeutic substances which may be prescribed and supplied to the horse by a veterinarian to treat a diagnosed condition or illness.
Where such a therapeutic substance (which is also a prohibited substance) is confirmed in an out of competition specimen from the horse, and such a substance was prescribed and supplied by a veterinarian in the treatment of a condition or illness, it is not a positive finding if there is a record and if this is correctly recorded in the Veterinary Treatment Register (VTR) for this horse.
Where such a therapeutic substance (which is also a prohibited substance) is confirmed in an out of competition specimen from the horse and such a substance was not prescribed and not supplied by the veterinarian in the treatment of an injury or a condition or illness, or in the absence of a record of this or not correctly recorded and detailed in the Veterinary Treatment Register for this horse, it is an offence which will be prosecuted.

The offence is not directly related to the finding of a prohibited substance (classes 3, 4 and 5) but is related to the absence of the prescribed procedure and records of when this horse was treated with this prohibited substance.

Prohibited substances can be contained within preparations and products which can be legally sourced and administered by a non-veterinarian (such as a trainer) within the out of competition period. Discussion of this can be found in the following sections of this document:

- V. Notes on easily accessible preparations in shops (without prescription).
- VI. Notes on over-the-counter and shopfront anti-inflammatory drugs substances (without prescription).
- VII. Notes on Tetrahydrocannabinol (THC), Cannabidiol and Cannabidiolic acid originating from Cannabis plants.

The administration of such preparations and products to the racehorse must be detailed in the relevant Veterinary Treatment Register.

Note that there are specific veterinary requirements relating to:

- the period of prescription
- the labelling of medication, including with horse name and with the VTR page number
- the prescription expiry date and the expiry date of such medication
- chronic medication prescription and VTR entry
- the renewing of chronic medication prescription
- the legibility of writing within Veterinary Treatment Registers and on medication labels
- the fact that the prescriptions and medications are specific to the particular horse.
- It could be an offence not to follow the prescribed procedure (the absence of such).

The above is provided in more detail in the documents:

- "Completion of the Veterinary Treatment Register" which is available on the NHA website (Equine Health and Welfare section).

Note that preparations and products which contain the substances Arsenic, Cobalt, Dimethyl sulphoxide (DMSO) and Salicylic acid precursors must be recorded in the relevant veterinary treatment register. This applies even though these are not necessarily scheduled medications which can only be prescribed and supplied by a veterinarian (some of these can be sourced and administered by a trainer). There is the same requirement to record substances which could elevate plasma total carbon dioxide (TCO2), Hydrocortisone, Methoxytyramine within out of competition in the racehorse. To record the above administrations is important as these could elevate concentrations to exceed the relevant International Thresholds in out of competition testing (OOCT) collected specimens. Findings of the above substances at a concentration exceeding the thresholds may not be actionable if legitimate treatments are appropriately recorded in the relevant Veterinary Treatment Register. This is discussed in the sections:

- This document section XI. Notes on the out of competition administration of Arsenic, Cobalt, Dimethyl sulphoxide (DMSO), Prednisolone, Salicylic acid and substances which could elevate plasma Total carbon dioxide (TCO2), Hydrocortisone and Methoxytyramine.
- The document "Completion of the Veterinary Treatment Register" on the NHA website (Equine Health and Welfare section).

Note that there is a stand down period (period during which the administered horse may not be raced) following the intra-articular administration of corticosteroid drugs to the racehorse. This is detailed in NHA Rule 72.1.46…
It will be an offence to race a horse within 7 days (the days calculated inclusively from the date of treatment) after the administration of any intra-articular corticosteroid treatment to this horse.

CLASSIFICATION OF PROHIBITED SUBSTANCES

Class 1: **Substances which have no place in horseracing, including illegal or Forbidden Substances.**

Included are substances forbidden in racing (including Forbidden Substances) such as anabolic and androgenic steroids and ester preparations thereof. Also included are schedule 7 and 8 substances as determined by the South African Health Products Regulatory Authority (SAHPRA), substances which are illegally sourced, human recreational drugs of abuse, insulin and Forbidden Substances as detailed in the Rules of the NHA (Appendix M) and which is inclusive of growth promoters, growth hormones, erythropoietins, synthetic haemoglobin oxygen carriers, snake venoms and ethanol.

Class 2: **Substances which have an obvious effect on the performance of the horse.**

These substances will affect the performance of the horse. Substances include central nervous system depressants and stimulants (excluding caffeine), barbiturates, cardiovascular system depressants and stimulants, psychoactive and psychotrophic drugs and neuromuscular blocking agents. Also included are local anaesthetics (excluding procaine), narcotic analgesics, natural and synthetic opioids, opiate agonists, opioid agonist-antagonists, ACTH (adrenocorticotropic hormone) and progesterones / oestrogens (if administered to the male horse).

Class 3: **Substances which have the potential to affect the performance of the horse with the potential to be abused.**

Drugs that may or may not have a generally accepted medical use in the racehorse, but pharmacologically have less potential to affect performance than drugs in Class 2. Substances include sedatives, antihypertensives, antihypotensives, cardiac glycosides, antiarrhythmic agents, respiratory stimulants, tranquillizers, benzodiazepines and caffeine.

Class 4: Substances which have a generally accepted veterinary (therapeutic) use in the racehorse but which have the potential to affect performance.

Classes include corticosteroids, non-steroidal anti-inflammatory drugs (NSAIDs), diuretics, bronchodilators, skeletal muscle relaxants, non-narcotic analgesics, antipyretics and procaine.

Class 5: Substances which have an accepted veterinary use in horses but which may have performance modifying ability.

Examples include anti gout medications, expectorants, antitussives, anti-diarrhoeals, anti-allergic drugs, antihistamines, anti-coagulants, haemostatics, antispasmodics and choleretic digestives.

PROHIBITED SUBSTANCE LIST

This list is inclusive of the local veterinary and human substances considered most important in treatment or of particular concern within horseracing in South Africa. This is not an exhaustive list.

Prohibited Substance (or metabolite or pro-drug)	**Class**
A	
Acebutolol	3
Acepromazine	3
Acetazolamide	4
Acetaminophen (Paracetamol)	4 V
Acetylsalicylic acid (Aspirin)	4XI/XVII/V/VIII
ACTH human synthetic (Adrenocorticotropic hormone)	2 XIII
Adrenaline	2
Adrenocorticotropic hormone (ACTH human synthetic)	2 XIII
Albuterol (Salbutamol)	1 II/XVII
Albuterol (Salbutamol) (valid veterinary prescription)	4 II/XVII
Alcohol (Ethanol)	1
Alfaxalone	2
Alfentanil	2
Allopurinol	3
Alprazolam	3
Altrenogest (in the male horse)	2
Ambroxol (active metabolite of Bromhexine)	5
Amiloride	4
Aminophylline	4
Amitriptylline	2
Arsenic	3 XI/XVII
Aspirin (Acetylsalicylic acid)	4 VIII/V/XVII
Atenolol	3
Atropine	5
Azaperone (Azapropazone)	3
B	
Baclofen	4
Beclomethasone	4
Benazepril	3
Betamethasone	4
Bisoprolol	3
Bromazepam	3
Bromhexine (converts to active Ambroxol)	5
Brotizolam	3
Budesonide	4
Buflomedil	3
Bupivacaine	2
Buprenorphine	2
Buspirone	2
Butorphanol	2
C	
Caffeine	3 XVI
Cannabidiol (CBD)	4 VII/V
Cannabidiolic acid (CBDA)	4 VII/V
Capsaicin	4
Captopril	3
Carbocysteine	5
Carboxy THC (THC-COOH)	4 VII/V
Carbon dioxide (total)	2 X/XI/XVII
Carprofen	4
Carvedilol	3
Cathine (Norpseudoephedrine)	2
Celecoxib	4
Cetirizine	5
Chlorpheniramine	5
Chlorpromazine	3
Chlorthalidone	4
Cinnarizine	5
Citalopram	3
Clanobutin	5
Clenbuterol	1 I/XVII
Clenbuterol (valid veterinary prescription)	4 I/XVII
Clidinium	5
Clobetasol	4
Clobetasol propionate	4
Clomipramine	2
Clonazepam	3
Clonidine	3
Codeine	2
Cobalt	3XIV/VI/XI/XVII
Cortisone	4

D	
Dantrolene	4
Dembrexine	5
Detomidine	3
Dexamethasone	4
Dextromethorphan	5
Dextropropoxyphene	2
Diamorphine (Heroin)	1
Diazepam	3
Diclofenac	4 VI/XVII
Digoxin	3
Diethyl amine salicylate	4 VIII/VII
Dihydrocodeine	2
Dimethyl Sulphoxide (DMSO)	4 XI/XVII
Diphenhydramine	5
Diphenylpyraline	5
Diprenorphine	2
Dipyrone (Metamizole)	4
DMSO (Dimethyl Sulphoxide)	4 XI
Dopamine	3
Doxapram	3
E	
Enalapril (Enalaprilat)	3
Enalaprilat (Enalapril)	3
Ephedrine	4
Epinephrine	2
Erythropoietin (EPO)	1 XIII
Ethanol	1
Ethinyl Estradiol (in the male horse)	2
Ethylestrenol (in the male horse)	2
Etofylline	4
Etoricoxib	4
Etorphine	2
F	
Fenoterol	4
Fentanyl	2
Firocoxib	4
Flavoxate	5
Fludrocortisone	4
Fluticasone propionate	4
Flumethasone (Flumetasone)	4 IV
Flunitrazepam	3
Flunixin	4
Fluocinolone	4
Fluoxetine	2
Fluphenazine	2
Flurazepam	3
Flurbiprofen	4 VI/XVII
Fluticasone	4
Formoterol	4
Furosemide	4 XVII /XVI
G	
Gabapentin	2
Glycopyrrolate	4
Growth Hormone (GH)	1 XIII
Guaifenesin	5
H	
Haloperidol	3
Haemoglobin glutamers	1
Haemoglobin oxygen carrier	1
Heroin (Diamorphine)	1
Hydrochlorthiazide (Hydrochlorothiazide)	4
Hydrocodone	2
Hydrocortisone	4 XI
Hydrocortisone hemisuccinate	4 XI
Hydroproxygesterone caproate (in the male horse)	2
Hydroxyprogesterone (in the male horse)	2
Hydroxyzine	3
Hyoscine (Scopolamine)	5
Hyoscine-N-butylscopolamine	5
I	
Ibuprofen	4 V
Imipramine	2
Indapamide	4
Indomethacin	4
Insulin	1
Ipratropium	4
Irbesartan	3
Isoxsuprine	4
K	
Ketamine	2
Ketoprofen	4 VI/XVII
Ketorolac	4
L	

Labetalol	3
Lamotrigine	3
Levodopa	3
Levonorgestrol	2
Lidocaine (Lignocaine)	2
Lisinopril	4
Loperamide	5
Loratidine	5
Lorazepam	3
Lormetazepam	3
Lornoxicam	4
Losartan	3
M	
Medetomidine	3
Medroxyprogesterone (in the male horse)	2
Medroxyprogesterone acetate (in the male horse)	2
Mefenamic acid	4
Meloxicam	4
Meperidine (Pethidine)	2
Mepyramine maleate	5
Mephenesin	4
Mepivacaine	2
Meprobromate (Meprobamate)	3
Methocarbamol	4 IX
Methyl salicylate	4 XI/VIII/V
Methyldopa	3
Methylphenidate	2
Methylprednisolone	4
Metoclopramide	5
Metoprolol	3
Midazolam	3
Minoxidil	3
Mometasone furoate	4
Morphine	2
N	
N-Acetylcysteine	5
Nalbuphine	2
Naloxone	2
Naltrexone	2
Nandrolone (Nortestosterone)	1
Naproxen	4
N-butylscopolamine	5
N-butyl-Scopolamine	5
Neostigmine	5
Nifedipine	3
Nitrazepam	3
Nitroglycerine	2
Norpseudoephedrine (Cathine)	5
Nortestosterone (Nandrolone)	1
O	
Oestradiol	2
Oxazepam	3
Oxybutynin	5
Oxycodone	2
Oxymorphone	2
Oxyphenbutazone	1
P	
Paracetamol (Acetaminophen)	4 V
Parecoxib	4
Paroxetine	2
Pemoline	2
Pentobarbital	2
Pergolide	3
Pethidine (Meperidine)	2
Phenazone	4
Pheniramine	5
Phenobarbital (Phenobarbitone)	2
Phenylbutazone	1
Phenylpropanolamine	3
Piretanide	4
Piroxicam	4
Prazepam	3
Prednisolone	4 XI
Prednisolone hemisuccinate	4 XI
Prednisone	4
Prilocaine	2
Probenecid	5
Procaine	4 III
Prochlorperazine	3
Progesterone	2
Propafenone	3
Propantheline (Propanthelline)	5
Propofol	2
Propranolol	3
Pseudoephedrine	3
Pyrilamine maleate	5

R	
Ractopamine	1
Ramifenazone (Isopyrin)	4
Reserpine	3
Risperidone	2
Robenacoxib	4
Rofecoxib	4
Romifidine	3
Ropivacaine	2
S	
Salbutamol (Albuterol)	1 II/XVII
Salbutamol (valid veterinary prescription)	4 II/XVII
Salicylic acid	4VI/XI/VIII/V/XVII
Salmeterol	4
Scopolamine (Hyoscine)	4
Scopolamine N-Butyl	5
Sertraline	3
Sibutramine	3
Sildenafil	3
Somatropin	1
Sotalol	3
Spirinolactone	3
Succinyl choline	3
Sufentanil	2
Sumatriptan	4
Synephrine	3
T	
Temazepam	3
Terbutaline	4
Testosterone	1
Testosterone cypionate	1
Testosterone undecanoate	1
THC & THC-COOH	4 VII/V
Tetrahydrocannabidiol	4 VII/V
Tetracaine	2
Tetramisole	5
Theobromine	4 XVI
Theophylline	4 XVI
Thiafentanyl	2
Tiletamine	2
Tilidine	2
Timolol	3
Torsemide	4
Total carbon dioxide (TCO2)	2 X/XI/XVII
Tramadol	2
Tranexamic acid	5
Trenbolone	1
Trenbolone acetate	1
Triamcinolone	4
Triamcinolone acetonide	4
Triazolam	3
Trimipramine	2
Tiludronic acid	3 XII/XVII
UVWXY	
Valerenic acid	4
Valsartan	3
Vedaprofen	4
Venlafaxine	2
Verapamil	3
Vitamin B12 (Cobalt containing)	3 XIV/V/XVII
Warfarin	5
Xylazine	3
Yohimbine	5
Z	
Zeranol	1
Zilpaterol	1 XV
Zolmitriptan	4
Zolpidem	2
Zopiclone	3
Zolazepam	3

Note that the above list is not comprehensive of all the substances being screened (or the substance which are prohibited) at the NHA Laboratory

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References within the PROHIBITED SUBSTANCE LIST below will be discussed in the sections:

I… Notes on Clenbuterol

II… Notes on Salbutamol (as contained in inhalers)

III… Notes on Procaine (as contained in procaine penicillin)

IV… Notes on Flumethasone administered by injection

V… Notes on easily accessible preparations in shops (without prescription)

VI… Notes on over-the-counter and shop-front anti-inflammatory drugs (without prescription)

VII… Notes on Tetrahydrocannabinol (THC), Cannabidiol and Cannabidiolic acid originating from Cannabis plants

VIII… Notes on Salicylic acid and its precursors

IX… Notes on Methocarbamol

X… Notes on substances that could elevate the total Carbon Dioxide level of the blood

XI… Notes on the out of competition administration of substances

XII… Warning not to use bisphosphonates

XIII… Notes on protein and peptide prohibited and forbidden substances

XIV… Notes on Cobalt (as contained in Vitamin B12 and supplements)

XV… Notes on Zilpaterol

XVI… Notes on Caffeine containing products (which also result in Theobromine and Theophylline as metabolites)

XVII… Refer to the Completion of the Veterinary Treatment Register which is available on the NHA website (Equine Welfare and Veterinary section).

I... Notes on Clenbuterol

Clenbuterol is a therapeutic substance found in local veterinary products for oral and injectable administration. It is a beta-2 adrenergic agonist bronchodilator drug that acts on receptors in the lungs to relax the muscles of the lower small airways to cause dilation of these airways.

As a bronchodilator with action to "reduce reversible airway obstruction" it is primarily prescribed for horses which suffer from Chronic Obstructive Pulmonary Disease (COPD) and and Inflammatory Airway Disease (IAD, also called Equine Asthma). This equine condition described as "difficulty to breathe, often progressively getting worse" is quite prevalent in South Africa due to sometimes dusty stable environments and local climatic conditions.

Clenbuterol is frequently prescribed to racehorses as part of a treatment regimen over several days to alleviate this.

Clenbuterol administration has be associated with some immediate adverse effects such as an increased heartrate, sweating and muscle tremors. In the longer term, clenbuterol administration is associated with potentially adverse effects on bone strength, sweating, the immune system, and the heart muscle.

Internationally the IFHA has assigned Clenbuterol as an "anabolic agent" with a classification corresponding to the NHA guidance of "Class 1" and it being a "Forbidden Substance". This classification applies to the substance type "beta-2 agonists", which includes Clenbuterol. This IFHA (Class 1, Anabolic Agent, with ban from horseracing for a 6-month period) classification applies "unless the substance is prescribed by a veterinarian as a bronchodilator".

The reference to its anabolic effects is because of studies indicating that it increases muscle mass and protein synthesis. Clenbuterol has an effect the metabolism of a horse, where it acts a repartitioning agent; it reduces body fat percentage and increases muscle weight, thereby mimicking the effects of androgenic anabolic steroids. These actions are interpreted as having a possible ergogenic (performance-enhancing) effect.

Ventipulmin is a locally registered Clenbuterol product which may be prescribed for the treatment of inflammatory airway disease (IAD) (also known as Equine Asthma) and other respiratory conditions in horses, characterised by constriction of the lower airways of the lungs.

Specific requirements of the NHA for the use of Clenbuterol in the racehorse:

These requirements are aligned with the international IFHA requirement specified for racehorses.

1. The use of Clenbuterol shall be limited to horses which have a documented clinical diagnosis of airway disease indicating the need for its therapeutic use.

2. The diagnosis, as determined by a veterinarian must be accurately recorded in a NHA Veterinary Treatment Register (VTR).

3. Only Ventipulmin Granules which is registered for use in horses in South Africa, may administered. No compounded medications shall be permitted for use.

4. Clenbuterol shall not be administered for more than 14 consecutive days and in accordance with the manufacturer's guidelines.

5. A minimum withdrawal period of 30 days shall apply between the last dose of a course of Clenbuterol treatment and the day of the race.

6. There shall be no more than two courses of Clenbuterol treatment (each a maximum of 14 consecutive days) permitted in any 6-month period, with an interval of not less than 30 days between courses.

Alternative therapies to Clenbuterol treatment are recommended:

Where possible, alternative veterinary therapies and management tools should be used in place of Clenbuterol. These alternatives to Clenbuterol are just as effective, but with less systemic

effects or side effects. Inhaled/nebulised treatments are far more direct and reduce the incidence of unwanted systemic effects.

- ✓ Corticosteroids (anti-inflammatory medication) administered by the inhaled route are the most effective means of treating horses with inflammatory airway disease (IAD), with mucolytic agents used if required, in addition to environmental management to reduce exposure to allergens.

- ✓ If short-term relief of bronchoconstriction is required, as an alternative to clenbuterol there are other beta-2 agonist bronchodilator drugs and anticholinergic bronchodilator drugs available as inhaled medications such as Ipratropium and Salbutamol (Albuterol).

When a positive finding of Clenbuterol is declared in the racehorse it is important for Inquiry Boards to consider the circumstances surrounding this positive, which could impact on which classification is most appropriate to be applied, and if a re-classified to not be Class 1, but less severe, is appropriate. To be carefully considered include the following aspects:

- The Clenbuterol preparation "Ventipulmin" consists of granules which are administered orally. It will often be stored in the feed room. The possibility therefore exists that this could end up in the feed of another horse.
- If another horse in the particular stable yard has been correctly prescribed, administered and recorded Clenbuterol within a period of time close to this positive finding.
- Clenbuterol treatment is often a treatment regime over several days (for example 7 days or more).
- The elimination of multiple doses of Clenbuterol from a horse can be detected for at least 6 days.

II... Notes on Salbutamol (as contained in inhalers)

Human asthma has a high prevalence and inhalers which contain Salbutamol, Budesonide, Fenoterol, Terbutaline, Salmeterol, Ipratropium or Fluticasone are commercially available for the treatment of such conditions. Several brands of such inhalers contain Salbutamol and these are sold as Schedule 2 (S2) medications. S2 medication does not require a prescription. S2 medication is available at the pharmacy counter if the personal details of the patient are supplied.

It has been observed such Salbutamol preparations are purchased by non-veterinarians and are administered to racehorses by means of "equine inhaler masks". Such administration could be for conditions such as Chronic Obstructive Pulmonary Disease (COPD) and Inflammatory Airway Disease (IAD, also called Equine Asthma).

It must be noted that Salbutamol is a beta-2 agonist which is classified as a Forbidden Substance (classification Class 1) in the rules of the NHA, in line with international policy from the IFHA. The relevant section of the rules of the NHA states "Forbidden Substance unless the substance is prescribed by a veterinarian as a bronchodilator at the appropriate dose and is reflected in the treatment record of the horse".

As a Class 1 substance and a so-called Anabolic Agent, a finding of Salbutamol in the racehorse is associated with high penalty and a ban from horseracing for a 6-month period.

It is therefore important to note that Salbutamol use, even in the form of an inhaler which is readily available from a pharmacy, must be prescribed by a veterinarian. It must be specified and formalised for the treatment of a particular horse. The preparation must be labelled according to the requirements of the NHA, and the horse's name and the treatment regimen must be completed in a relevant NHA Veterinary Treatment Register (VTR).

III… Notes on Procaine (as contained in Procaine Penicillin)

Procaine positives are most likely associated with the administration of Procaine Penicillin. This has been taken into consideration in the placement of Procaine into Class 4 instead of Class 2 with other local anesthetics, unless evidence suggests a Class 2 contravention, such as when pure Procaine was proven to be administered.

IV… Notes on Flumethasone administered by injection

Flumethasone is a therapeutic substance which forms part of locally available veterinary injectable preparations. It is prescribed and administered to the racehorse for injury associated pain and inflammation. Within international literature and NHA literature there is no publication of a detection time in the racehorse for this prohibited substance. The NHA conducts screening and confirmation for the presence of this substance in both urine and blood (plasma) to international guidance, at a level which is considered to have an effect on the horse, when other, similarly potent corticosteroids are considered.

- ✓ Flumethasone intravenous (IV) administration
  Notification is provided that following an intravenous (IV) administration of a typical therapeutic dose of Flumethasone to a racehorse, a detection period of at least 48 hours must be considered. A period of withdrawal which is longer than this period must be applied to prevent a level of Flumethasone which would result in a positive finding for this substance in either urine or blood (plasma).

- ✓ Flumethasone intra-articular (IA) administration
  Rule 72.1.46 of the NHA specifies that it is a prohibited practice and a contravention to "race a horse within 7 days, calculated inclusively from the date of treatment, after the administration of any intra-articular corticosteroid treatment". This rule applies for intra-articular treatment with the corticosteroid Flumethasone.

V… Notes on easily accessible preparations in shops (without prescription)

Vitamin B12

The element Cobalt is an integral part of vitamin B12. The administration of vitamin B12 has the effect of increasing the natural plasma and urine level of Cobalt in both urine and plasma. There is an international threshold value for Cobalt in both plasma and urine, exceeding which a prohibited substance finding is declared.
The above is discussed in more detail in a separate section of this document XI… Notes on the out of competition administration of Cobalt.

Cobalt containing products.

Well-known Cobalt containing products for horses include Red Cell, Hemo-15, V.A.M. injection, Kyro B + Liver, Kyrovital, Kyrophos Metabolic, Catasol, Intravit, Biosol, Iron Power, Hemopar, Itamaster, Hemostam, Ultra-Fer 300 and Total Control. This is not an exhaustive list.
The above is discussed in more detail in a separate section of this document XI… Notes on the out of competition administration of Cobalt.

Aspirin (Acetylsalicylic acid) containing preparations

Many commercial human medications (including tablets and pills) contain Acetyl salicylic acid (which is precursor of Salicylic acid). Salicylic acid is a substance found in nature and in equine feed. There is an international threshold value for Salicylic acid exceeding which a prohibited substance finding is declared. Refer to the section below for more information. This is discussed in more detail a separate section of this document.

Liniments, rubs and other preparations containing Salicylic acid

Preparations which contain Salicylic acid, Acetyl salicylic acid, Diethylamine salicylate and Methylsalicylate are precursors of Salicylic acid. There is an international threshold value for Salicylic acid in both plasma and urine, exceeding which a prohibited substance finding is declared. Medication and preparation labels must be checked if these contain any of the above Salicylic acid precursors. These could include powders, liquids and topically applied ointments and gels.

Commercial preparations include Salsprin (injectable), Sloan's Heat Rub cream, Reparil Gel, IceVet, Thermo Rub, Rigly Horse Liniment; Deep Heat Rub, Equiline Liniment Liquid, Oil of Wintergreen, Sprain Liniment Gel; Vet Balm; Sebbaderm shampoo, Vetsence Otiderm and Sodium Salicyl. Note that this is not an exhaustive list.

The above is discussed in more detail in a separate section of this document… VIII Notes on Salicylic acid and its precursors.

Paracetamol and Ibuprofen containing preparations

Paracetamol and Ibuprofen are prohibited substances in racing as these are anti-inflammatory drugs. Such preparations are found in shop fronts as tablets or syrups, without a prescription being required.

Cannabis derived products, oils and isolates

Many pharmacies and health shops now sell Cannabis (dagga and hemp) plant originating products. The substances Tetrahydrocannabinol (THC), Cannabidiol (CBD) and Cannabidiolic acid (CBDA) which could be contained in such products could result in positive finding in racehorses.

Cannabis products are discussed in more detail in a separate section of this document … VII Notes on Tetrahydrocannabinol (THC), Cannabidiol and Cannabidiolic acid originating from Cannabis plants.

VI… Notes on over-the-counter and shop-front anti-inflammatory drugs (without prescription)

Non-steroidal anti-inflammatory drugs (NSAID's) are pharmaceutical substances which are prescribed for the treatment of muscle and joint injury, pain, swelling and inflammation. These can be found in tablets, capsules and injections. These are most often obtained by medical prescription or when dispensed by a pharmacist. These non-steroidal anti-inflammatory drugs can however also be obtained in certain products which do not have a pharmaceutical schedule and are sold in shops and pharmacies without a prescription. The use of such preparations in racehorses can result in positive findings for these prohibited substances.

These preparations are normally liniments or bandage packs, with a few examples listed below (this is not a comprehensive list):

Voltaren Emulgel containing……. Diclofenac
Fastum containing…… Ketoprofen
Transact containing…… Flurbiprofen
Deep Relief Ibuprofen Gel which contains…….. Ibuprofen
Deep Heat which is a source of…… Salicylic acid
Reparil Gel which is a source of…….. Salicylic acid

It is important to adhere to suitable withdrawal periods when using such preparations in horses.

VII... Notes on Tetrahydrocannabinol (THC), Cannabidiol and Cannabidiolic acid originating from Cannabis plants

Natural or herbal substances or remedies and/or drugs which have antipyretic, analgesic and anti-inflammatory properties are prohibited in racing (NHA Rule 73.4.2.1). Two such natural anti-inflammatory substances are Cannabidiol (CBD) and Cannabidiolic acid (CBDA), found in many Cannabis plant species, including cannabis (dagga) and hemp plants. Note that medicinal oils, ointment and creams which originate from these plants could contain elevated levels of these substances. Furthermore, oil preparations of pure Cannabidiol which have been isolated from plants are commercially available.

Tetrahydrocannabinol (THC) is one of the principal psychoactive constituents found in many Cannabis species plants. It is a prohibited substance in horseracing and its administration typically results in positive finding(s) of its metabolite(s), such as 11-nor-delta 9 tetrahydrocannabinol-9-carboxylic acid (carboxy-THC).

It is cautioned that the use of Cannabis preparations and the use of horse bedding which has hemp plant as a component (which horses may be able to ingest) could result in the above or other prohibited substance positive findings in racehorses.

VIII... Notes on Salicylic acid and its precursors

Salicylic acid is a substance found in the normal feed of horses such as lucerne and hay. During previous years large populations of racehorses from all over the world were screened for natural levels of salicylic acid which is ingested in such feeds. Considering the possible diets of horses and worst-case scenarios, a single salicylic prosecution threshold was decided on an international basis. This IFHA threshold has been established with an extremely high probability that untreated horses on a variety of feeds will present levels far below this salicylic acid threshold. The NHA has formally adopted this threshold as it was found suitable in our racing: "Salicylic acid…… 6.5 micrograms salicylic acid per milliliter in plasma" as shown on the NHA website. A specimen is only declared a positive finding when the concentration of salicylic acid is accurately confirmed (full quantitative analysis is conducted as part of such a positive finding) to exceed this threshold, in accordance with Rule 73.4.4.

It is known that Aspirin can be added to the feed of horses to acts as an analgesic and anti-inflammatory substance. Acetyl salicylic acid (Aspirin) is however a pro-drug of Salicylic acid, implying that Aspirin will be converted to Salicylic acid within the horse. Aspirin is not a scheduled substance (in contrast to most analgesic and anti-inflammatory substances) and it can readily be obtained. The administration of Aspirin to the racehorse must be recorded in the Veterinary Treatment Register of the horse. The use of Aspirin too close to race day is likely to result in salicylic acid prosecution. Be aware that guidance on the use of Aspirin products in the horse differs between different manufacturers.

Following the administration of a single dose of Aspirin to a racehorse a detection period of two days applies (this is not a withdrawal time). Consult your veterinarian in regard to a suitable withdrawal period.

IX... Notes on Methocarbamol

Methocarbamol is a muscle relaxant used to treat skeletal muscle spasms, with some effect on the central nervous system. One of its actions is to block nerve impulses (such as pain sensations) to the brain.

Methocarbamol is locally available as a human tablet preparation of commercial name "Robaxin". It has therapeutic application in the horse and is used for the treatment of acute inflammatory and traumatic conditions of the skeletal muscle to reduce muscle spasm and effect muscle relaxation.

Methocarbamol is a substance with an Asian Racing Federation screening limit and as member of this federation, the NHA has adopted this limit. This screening limit of 100 ng/ml in urine applies to: "Methocarbamol (restricted to single oral or IV treatment of no more than 5 grams)"

Within this guidance above it is clearly stated that it applies only to a single administration. The reason for this is that multiple doses of this substance have been reported to result in an accumulation of Methocarbamol. This is non-predictable between different horses. This accumulation implies that multiple doses have an excretion time which is much longer than that of a single dose.

In oral studies there has been evidence of recycling during some trials. Recycling is when the preparation remains present in stable areas after administration (for example spilling, dripping or spitting by the horse), or when the substance is excreted in the urine and faeces and re-enters the horse. Such recycling can be reduced if the stable is frequently and thoroughly cleaned. It must be considered that Methocarbamol it is not highly soluble in cold water. Recycling can be non-predictable between horses and within different stable environments.

It is recommended that Methocarbamol only be used as single dose treatment to the racehorse, with a detection time of about 48 hours (about two days). With this detection time, a withdrawal time significantly longer than this must apply. In addition to this statement and guidance is the fact that a withdrawal period of several weeks must be applied when multiple doses are administered as part of a treatment regimen.

X... Notes on substances that can elevate the Total Carbon Dioxide level of the blood

The administration of products and preparations which contain bicarbonate has the result of increasing the total Carbon Dioxide level of the blood. There is an international threshold value for Total Carbon Dioxide exceeding which a prohibited substance finding is declared.

Note that total Carbon Dioxide levels can also be elevated by means of alkalinisation agents. These could be buffers, drenches and drips and can include alkalinizing agents such as bicarbonates, citrates, succinates, acetates, propionates, maleates, lactates, trometamol, tris buffer or trometamine (this is not an exhaustive list). Included in the list are products described as urinary alkalinisers and "hind gut buffers".

XI... Notes on the out of competition administration of Arsenic, Cobalt, Dimethyl sulphoxide (DMSO), Prednisolone and Salicylic acid and substances which could elevate plasma Total carbon dioxide (TCO2), Hydrocortisone and Methoxytyramine

Note that the out of competition use of preparations and products which contain the substances Arsenic, Cobalt (vitamin B12), Dimethyl sulphoxide (DMSO), Hydrocortisone, Prednisolone and Salicylic acid must be recorded in the relevant veterinary treatment register even though these are not all scheduled medications which may only be prescribed and supplied by a veterinarian (some of these can be sourced and administered by a trainer).

There is the same requirement to record substances which could elevate plasma carbon dioxide (TCO2), Hydrocortisone and Methoxytyramine in the racehorse out of competition testing and elevate such levels in out of competition testing collected specimen.

These treatments will not be actionable if a legitimate treatment is appropriately recorded in the relevant Veterinary Treatment Register.

XII... Warning not to use bisphosphonates

Bisphosphonates is a class of drug which prevents the loss of bone density in the racehorse. These are substances which are prohibited within the Rules of the NHA:

73.4.1 Substances capable at any time of causing an action or effect, or both an action and effect.… 73.4.1.6 the musculoskeletal system

The International Federation of Horseracing Authorities (IFHA) advised that, from 1 January 2027, the International Agreement on Breeding, Racing and Wagering (IABRW, Article 6) will specify a total ban on bisphosphonate (BP) administration to racehorses.

This ban in the use of bisphosphonates in racehorses at any time is due to significant IFHA welfare-related concerns associated with the use of BPs, including BP-induced interference to bone adaptation and remodeling in growing and exercising horses (potentially resulting in an increased risk of fracture), and evidence that BPs have an analgesic effect (and may be used/abused for this effect).

The ban will correspondingly be adopted by the NHA on 1 January 2027, and racehorses treated with bisphosphonates on or after 1 January 2027 will be subject to a minimum six-month ban from racing.

XIII... Notes on protein and peptide prohibited and forbidden substances

Most conventional medications contain drug substances which are small chemical molecules. Many of these can affect the horse and hundreds of these are routinely screened for by the NHA Laboratory. Many of the newer generation substances which are prohibited and which are of concern are peptides and proteins similar to those found naturally in the horse. This Laboratory is actively involved in a program to extend the screening of racing and out of competition specimens for an increasing number of peptide and protein substances which can affect the horse. These are the future drugs of concern, most of these substances are classified as Class 1, Forbidden Substances within the Rules of the NHA.

Erythropoietin (EPO)

Erythropoietin is a naturally occurring protein hormone which has the function to increase red blood cell production in the horse. Natural EPO can be supplemented by the administration of several different forms of human EPO to the horse. At the NHA Laboratory the screening of human EPO in horse specimens is being undertaken employing a sophisticated immuno-detection screening methodology which is widely reported as the most accurate and sensitive currently available to the racing industry. A highly attractive aspect about this is the wide range of EPO types which are covered, as has been confirmed by EPO administration and research studies at racing laboratories. Included in the effective coverage of the screen are conventional EPO forms such as Epogen, Eprex, Epoetin-alpha, Epoetin-beta and Procrit and even longer acting EPO types called darbepoetin alfa (Aranesp, DPO) and CERA (PEG Epoetin-beta, MirCERA).

Growth Hormone (GH)

Growth Hormone refers to a natural hormone within the horse which is anabolic and which has the effect to enhance cell growth and cell recovery. In addition to this naturally occurring equine GH there are a range of synthetic GH's from several animal species which are active in the horse. These include a modified form of equine GH, bovine (cattle) GH and porcine (pig) GH. The NHA Laboratory employs a sensitive immune-detection screening approach which was shown effective in detecting the use these hormones by means of the measurement of the amount of the messenger protein "IGF-1". The screening methodology measures the IGF-1 concentration against the level which is normal in the horse and can also detect the use of and some IGF-1 analogues and synthetic IGF-1 forms. The NHA Laboratory was 20 year ago, in partnership with a few other countries, instrumental in conducting important research into suitable screening methodologies and validating these screening approaches.

Adrenocorticotropic hormone (ACTH)

Adrenocorticotropic hormone is a protein hormone naturally produced in the horse. The function of ACTH is to stimulate and also regulate levels of the steroid hormone cortisol. Commercially available ACTH is a synthetically produced peptide hormone which is high similar in structure to ACTH produced naturally. As a prohibited substance in horseracing the use of synthetic ACTH is most monitored and prosecuted by the increase which is observed the level of naturally produced hydrocortisone. As the hydrocortisone level increases beyond the international threshold, this is prosecuted as a prohibited substance offence.

There are also other approaches to detect the use of synthetic ACTH. One of these is based on the fact that synthetic ACTH corresponds to the structure of human ACTH. It can therefore be detected in the horse as the structure of this protein is somewhat different to naturally produced ACTH in the horse. The NHA Laboratory has been active in the research of new approaches for the detection of synthetic administered ACTH in the racehorse. During recent years ACTH administration trials were conducted on horses as part of such research at the NHA Laboratory. This research was formally presented at an international conference for horse racing chemists and veterinarians (ICRAV).

It must be noted that at least one web-based sales company is selling a product which is purported to contain the biochemically active molecule of ACTH. Several racing laboratories have already analysed this preparation. Such analysis however indicated that the active peptide ACTH is either not contained or is only contained in a very low concentration, certainly too low to affect the horse.

The NHA is well-aware of the threat which the peptide and protein-based Class 1, Forbidden Substances pose to the integrity of racing and the welfare of the horse. For this reason these screening methods have been in place at the NHA for many years.

XIV… Notes on Cobalt (as contained in Vitamin B12 and supplements)

Cobalt is naturally found in all mammal bodies and animal feed and is considered an essential dietary trace element and micronutrient. Cobalt deficiency is not observed in horses in the wild and the normal diet of horses in combination with the usual prescribed vitamin supplementation should supply the horse with sufficient cobalt for its well-being and health. Cobalt is classed as a 'heavy metal' and is a structural component of Vitamin B12 (Cobalamin). This vitamin is involved in the normal functioning of the brain and nervous system and in the final stages of red blood cell formation and maturation. All of Cobalt's potential physiological effects in the horse have not yet been determined; however, high doses can present severe toxic effects and can be detrimental to the health of the horse.

Evidence suggests that cobalt preparations are/were being used inappropriately in racehorses in some racing jurisdictions. As Cobalt is naturally present in equine biological samples such as

blood and urine, it was decided that the introduction of an international threshold for Cobalt is necessary to facilitate the control of misuse in racehorses.

Trainers are advised that the International Federation of Horseracing Authorities (IFHA) has set international thresholds in horse urine and in horse plasma. The NHA, as a signatory country of the IFHA, has adopted these thresholds in its rules. This decision was made following a survey which showed that natural levels of cobalt in racehorses within South Africa correspond to those observed in other countries and that the threshold can be applied to the local population.

A large range of registered oral and injectable veterinary supplements which contain Vitamin B12 (Cobalamin) or Cobalt salts are available for use in the horse. The administration of any of these could give rise to an elevation of total cobalt levels in blood and urine. There is not a listing of commercial preparations which contain cobalt as it will be difficult to keep the list complete. Be aware of the amount of Cobalt provided to the horse (also from dietary sources) and follow the guidance of the NHA for the withdrawal of products which contain significant amounts of cobalt.

Note that many feeds contain relatively high levels of Cobalt. Feeds with 0.4 mg Cobalt/kg feed or higher are considered fortified feeds. The use of such fortified feeds increase Cobalt concentration but have not been shown to result in Cobalt levels which would exceed the urine threshold. Note that the use of such feeds would eliminate the need for any other Cobalt supplementation in the horse.

It is recommended that supplemental cobalt from any source, including registered cobalt containing supplements and Vitamin B12 (Cobalamin), not be administered to the horse within at least two full days prior to race day. Higher doses than those indicated by the product and also repeated administrations may require longer elimination periods. Note that reliance on and use of this guidance does not absolve or diminish a trainer or owner from being responsible for ensuring that the horse complies with the rules relating to the presence of drugs and prohibited substances when presenting a horse.

International Federation of Horseracing Authorities Advisory Document:
Cobalt, additional information

International thresholds for Cobalt in plasma and urine are published in Section 16 of Article 6A of the International Agreement on Breeding, Racing and Wagering as 0.1 microgram total Cobalt per millilitre in urine and 0.025 microgram total Cobalt (free and protein bound) per millilitre in plasma. In order to provide international consistency regarding the use of Cobalt containing supplements, National Racing Authorities may wish to advise the following:

1. The threshold levels were determined following an international survey of cobalt concentrations in racehorses on race days.
2. A normal racing diet is more than sufficient to meet a horse's nutritional requirements for Cobalt and Vitamin B12; neither cases of Cobalt deficiency nor disease for which Cobalt is the indicated treatment have been documented in the horse.

3. From evidence to date, as a guide, no more than 1 mg of Cobalt from a single dose should be given by injection and no more than 5 mg by mouth within the day preceding race day. Local Rules regarding administration of Prohibited Substances in the period leading up to and including race day must be noted.
4. Injectable Cobalt supplements offer no nutritional advantages because incorporation of Cobalt into the Vitamin B12 molecule occurs within the horse's gut.
5. Trainers should consult with their veterinarians to ensure that their oral supplementation regimen provides only the amount of Cobalt necessary to meet the scientifically established nutritional requirements of the horse for Cobalt. The safest strategy is the selection of supplements with low amounts of Cobalt, or not to use them at all.
6. Nutritional supplements should only be administered at the manufacturer's recommended dose and frequency of dosing. The labels of such products should be read carefully every time that they are used.
7. Many products have not been evaluated to determine if they affect Cobalt concentration in the horse. The use of unregistered, inadequately labelled supplements containing Cobalt risk breaching the thresholds and is extremely unwise.
8. Vitamin B12 contains Cobalt; the simultaneous use of multiple supplements containing Cobalt and Vitamin B12 risks breaching the thresholds.

XV... Notes on Zilpaterol

Zilpaterol is a chemical substance which is commercially used in South Africa in feed for cattle destined for meat production. It is reported that this substance is harmful to horses and can result in adverse side effects. It is a Class 1 substance with Anabolic Agents.

During 2019 the NHA provided a notice that traces of the substance Zilpaterol was noted in some racehorse specimens, originating from all over the country. In South Africa this substance is a component of some commercial feed rations supplied to cattle destined for meat production. Stakeholders were urged to take precautionary steps to monitor that the feed sourced for horses would not have Zilpaterol present.

Positive findings of Zilpaterol in racehorses competing in France during October 2020 has highlighted the possibility of contamination of horse feed with this substance, which is prohibited (forbidden) in racing. This feed contamination within Europe was recently shown to originate from contaminated molasses which was sourced from South Africa. It must be noted that significant volumes of molasses are locally fortified with Zilpaterol, for use in cattle feedlots.

The above considered, there is some possibility that molasses (or feedstuff destined for cattle feedlots) could introduce some Zilpaterol into local horse feed. The NHA therefore recommends that racehorses are only fed:

- ✓ Feed which has some assurance / certification from the supplier not to contain Zilpaterol,
- ✓ and / or feed made from crops / raw materials (especially molasses) which have some assurance / certification from the supplier to not contain this substance,

- ✓ and / or feed of which finished product batches are in fact tested by the supplier not to contain this substance.

XVI… Notes on Caffeine containing products (which also result in Theobromine and Theophylline as metabolites)

Caffeine and its metabolites Theophylline and Theobromine are prohibited substances. These are prohibited substances which both naturally occurring and commercial available within many supplement products. As Caffeine is extensively and frequently recreationally used by humans, horses are often exposed to low amounts of Caffeine from horse feed, other foodstuffs and the human environment around horses. For this reason, and for reason that Caffeine and its metabolites are not high potent substances, the IFHA has established horseracing urine and / or plasma International Residues Limit (IRL) for Caffeine, Theophylline and Theobromine.

Caffeine is considered to have a more significant effect on the horse than on the humans. This is for reason that humans are accustomed to this substance by means of often frequent recreational use, and desensitisation is mentioned. Effects of Caffeine on mammals can include increased breathing and heart rate, an increased mental alertness and a perceived physical energy or enthusiasm. Caffeine and its metabolites have been shown to be excreted from the horse less rapidly than a human.

Studies have shown that while Caffeine excretion is relatively slow, the concentration of the metabolites Theophylline and Theobromine can also become quite high. These metabolites are also not rapidly excreted. These two metabolites are also drugs with highly likely performance enhancing effects.
Theobromine in a positive way influences human moods and state of alertness. It can increase our heart rate. This drug is known as a vasodilator (a blood vessel widener) and as a heart stimulant.
Theophylline relaxes the smooth muscles located in the bronchial airways and pulmonary blood vessels. The action of Theophylline includes the widening of the airways, by means of relaxing the muscles and decreasing the effect of substances that cause airways to constrict. This drug is used in therapy for respiratory diseases such as chronic obstructive pulmonary disease (COPD) and asthma. Theophylline furthermore increases heart rate and systolic blood pressure.

Note that coffees, some teas (including green tea) and guarana contain relatively high amounts of Caffeine. Note that cocoa and chocolate contain much Theobromine. When horse feeds are found to contain Caffeine of these related substance, it is often due to the feed raw material being exposed to such crops and products.