

## GAR 83 (10) COBALT THRESHOLD –

### FREQUENTLY ASKED QUESTIONS

**Q. What is the cobalt threshold?**

A. The threshold is 100 nanograms per millilitre of urine.

The urinary cobalt threshold has been determined following a national population survey that measured urinary cobalt levels in 762 greyhounds sampled on race day. The median value was 3.44 ng/mL and 74% of samples were below 10 ng/mL. It has been set at 100 ng/mL to allow for a robust margin of safety with normal amounts of cobalt supplementation through routine nutritional sources.

**Q. What is cobalt?**

A. Cobalt is a naturally occurring trace element that is normally present in greyhounds at very low levels as a result of normal dietary intake. Cobalt is present in the structure of vitamin B12 (cyanocobalamin).

Cobalt is an inducer of hypoxia-like responses, which are capable of inducing gene modulation at the hypoxia inducible factor pathway to increase erythropoietin expression and therefore its potential abuse as a blood doping agent in racing must be controlled.

Vitamin B12 is a water-soluble vitamin with a key role in the normal functioning of the brain and nervous system, and for the formation of blood. It is involved in the metabolism of every cell of the body, especially affecting DNA synthesis and regulation, as well as fatty acid synthesis and energy production.

Vitamin B12 deficiency is not common in dogs. On a feed basis, the Association of American Feed Control Officials (AAFCO, 2007) recommended 22 µg of Vitamin B12 per kg of food on a dry matter basis for all classes of dogs i.e. approximately 1 µg of cobalt per kg of dry dog food. Therefore feeding of normal commercially available, nutritionally balanced and respected dry foods (kibbles) will not lead to urinary cobalt levels exceeding the threshold.

**Q. Could I breach the threshold with registered vitamin supplements in feed or by injection?**

A. Yes.

Trainers should be extremely cautious using products that contain cobalt close to racing as this may inadvertently lead to a rise in urinary cobalt levels. Compliance with GAR 83A Raceday Treatment will minimise the risk of inadvertently exceeding the threshold, but a greater withholding period is required for some substances, particularly injectable products.

Administration, particularly by injection and on multiple occasions or at larger 'off-label' doses, or in combination with other cobalt containing products, of certain registered 'supplements' close to racing may result in a level of cobalt in a subsequent sample that exceeds this threshold.

**Q. How much Cobalt is in Vitamin B12?**

- A. Cyanocobalamin is approximately 4.35% Cobalt  
Hydroxycobalamin is approximately 4.38% Cobalt

For example: 1000 µg/mL of Cyanocobalamin equals 43.5 µg/mL of Cobalt and 1000 µg/mL of Hydroxycobalamin equals 43.8 µg/mL of Cobalt.

**Q. How much Cobalt is in various Cobalt salts?**

- A. Cobalt Sulphate is approximately 38.02% Cobalt  
Cobalt Gluconate is approximately 13.21% Cobalt  
Cobalt Carbonate is approximately 49.55% Cobalt  
Cobalt Chloride is approximately 45.39% Cobalt

For example: 1000 µg/mL of Cobalt Sulphate equals 380.2 µg/mL of Cobalt; and 1000 µg/mL of Cobalt Gluconate equals 132.1 µg/mL of Cobalt; and 1000 µg/mL of Cobalt Carbonate equals 495.5 µg/mL of Cobalt; and 1000 µg/mL of Cobalt Chloride equals 453.9 µg/mL of Cobalt.

**Q. How long will Cobalt swab positive for?**

- A. As with any substance this depends on a number of factors listed below and veterinary advice is recommended prior to administering any of these products. As a general rule avoid the administration of cobalt by injection within 48 hours of racing and orally after the evening meal prior to race day. However many factors must be considered and some substances will swab positive for more or less time.

It is important to clarify that detection times are not withdrawal times and should not be construed as such. There are many relevant factors in relation to any substance that could give rise to unpredictable and prolonged excretion times including:

- An animal's general health status, its physiology, metabolism, hydration status, fitness level, training regime, nutritional and dietary supplementation and concurrent medical treatment.
- Dose rate (i.e. the amount given per kg) – a higher dose will take longer to remove from the body system and could be detrimental to the dog's health. Combining similar supplements may also increase the dose rate as each may contain cobalt.
- Treatment duration and frequency (i.e. how long a supplement is given for and how often) – a cumulative effect could occur where supplements are given for extended periods, particularly when this is against the directions of the manufacturer ('off-label').
- Route of administration (i.e. orally or by injection) – injection of cobalt supplements will lead to much greater levels of cobalt and therefore requires greater withholding periods prior to racing than orally administered cobalt. Oral administration of some highly concentrated products will still lead to a breach of the cobalt threshold and require an adequate withholding period.
- Pharmaceutical preparation (i.e. how much cobalt it contains) – different cobalt salts contain different amount of cobalt. The preparations may also have different properties that result in e.g. different rates of absorption.

Careful consideration of the above factors and adequate veterinary advice is important prior to administering cobalt containing substances, particularly by injection. More conservative withdrawal times may need to be implemented.

*N.B. Reliance on this communication will not be a defence in the event of a breach of the rules. All participants in races do so subject to, and take full responsibility for their compliance with, the rules which contain, amongst other things, provisions relating to prohibited substances, the disqualification of greyhounds that have been found to have received them and the punishment of those who administer them.*

*GRNSW is not to be taken to endorse, recommend, or make any other comment pertaining to the quality or suitability of any of the products mentioned, nor does it warrant that these products are suitable for use and/or consumption in connection with greyhounds or any other canine.*

**Q. What products have been studied?**

A. Hemo-15 injection, VAM paste and VAM injection.

**VAM® Paste**

VAM<sup>®</sup> Paste (CEVA) is a commercially available product registered as a supplement (vitamins, amino acids and minerals) paste. The cobalt salt is cobalt sulfate (240 µg/mL) and contains cyanocobalamin (150 µg/mL). This is equivalent to around 98 µg/mL of cobalt. The manufacturer's recommended dose rate in dogs is 0.25-1mL per 10kg bodyweight, twice weekly, administered orally.

**Dose administered:** 1mL/10kg, administered orally on two occasions on alternate days (6 dogs). This is equivalent to a dose rate of 24 µg/kg of cobalt sulphate and 15 µg/kg of cyanocobalamin or 293 µg of cobalt PO to a 30 kg greyhound.

**Results:** Cobalt levels detected above the 100 ng/mL threshold (maximum 317 ng/mL at 4 hours) for up to 6 hours after the second dose, but did not return to resting levels for 24 hours after the second dose. A cumulative effect may occur with this product.

**Minimum withholding period:** A minimum withholding period of 24 hours is suggested.

### **VAM<sup>®</sup> Injection**

VAM<sup>®</sup> Injection (CEVA) is a commercially available product registered as a supplement (vitamins, amino acids and minerals) injection. The cobalt salt is cobalt sulfate (240 µg/mL) and contains cyanocobalamin (150 µg/mL). This is equivalent to around 98 µg/mL of cobalt. The manufacturer's recommended dose rate in dogs is 0.25-1mL per 10kg bodyweight, twice weekly, administered intramuscularly.

**Dose administered:** 1mL/10kg, administered intramuscularly on two occasions on alternate days (6 dogs). This is equivalent to a dose rate of 24 µg/kg of cobalt sulphate and 15 µg/kg of cyanocobalamin or 293 µg of cobalt IM to a 30 kg greyhound.

**Results:** Cobalt levels detected above the 100 ng/mL threshold (maximum 6523 ng/mL) for up to 48 hours after the second dose, but did not return to resting levels for at least 72 hours after the second dose. A cumulative effect may occur with this product.

**Minimum withholding period:** A minimum withholding period of 96 hours is suggested.

### **Hemo-15<sup>®</sup> Injection**

Hemo-15<sup>®</sup> (Virbac) is a commercially available product registered as a supplement (iron, amino acid and B-vitamin) injection. The cobalt salt is cobalt gluconate (0.7 mg/mL) and contains cyanocobalamin (150 µg/mL). This is equivalent to around 99 µg/mL of cobalt. The manufacturer's recommended dose rate (in horses) is 1mL per 50kg of bodyweight, administered intravenously.

**Dose administered:** 1mL, administered intravenously, once per day for three days (6 dogs). This is equivalent to a dose rate of 23 µg/kg of cobalt gluconate and 5 µg/kg of cyanocobalamin or 99 µg of cobalt IV to a 30 kg greyhound.

**Results:** Cobalt levels detected above the 100 ng/mL threshold (maximum 1350 ng/mL) for up to 24 hours after the third dose, but did not return to resting levels for 48 hours after the third dose. A cumulative effect may occur with this product.

**Minimum withholding period:** A minimum withholding period of 48 hours is suggested.

**Q. How much Cobalt is in this oral product and how long will it swab for?**

A. This depends on a number of factors listed above and the minimum suggested withholding period is only a guideline. Veterinary advice is recommended prior to administering any of these products. A number of products are listed below and give the amount of Cobalt administered to a 30kg greyhound if manufacturer's maximum dosage recommendation is followed.

Product Name	Cobalt Active Ingredients	Labelled Dose for Dogs	Upper dose for 30kg dog (Co)	Min. suggested withholding period
V.A.M. PASTE CEVA ANIMAL HEALTH	COBALT SULFATE 240µg/mL   CYANOCOBALAMIN 150µg/mL	0.25-1mL/10kg PO	293.3µg	Minimum 24 hours
BLOOD BOOSTER ORAL HEMATINIC FOR HORSES AND GREYHOUNDS	COBALT SULFATE 11µg/g   CYANOCOBALAMIN 733µg/g	5g PO	180.3µg	Minimum 24 hours
SUPERCELL - BIG DOG	COBALT CARBONATE 90µg/g   CYANOCOBALAMIN 2.5µg/g	4g PO	178.8µg	Minimum 24 hours
TROY HEMOPLEX PASTE	COBALT SULFATE 240µg/g   CYANOCOBALAMIN 150µg/g	0.5mL/10kg PO	146.7µg	Minimum 24 hours
FERAMO D VIRBAC AUSTRALIA	CYANOCOBALAMIN 3.2µg/g / COBALT SULFATE 90µg/g	2-4g PO	137.4µg	Minimum 24 hours
TRIPART PASTE CEVA	CYANOCOBALAMIN	1mL/10kg PO	65.2µg	Not on race day

ANIMAL HEALTH	500µg/mL			
RAPIDVITE AMINO VITE GB	COBALT CARBONATE 11.4µg/g   CYANOCOBALAMIN 1.5µg/g	5-10g PO	57.0µg	Not on race day
HI-VITE FOLIC ACID AND VITAMIN B12 PASTE CEVA ANIMAL HEALTH	CYANOCOBALAMIN 750µg/mL	1mL PO	32.6µg	Not on race day
STOCKGAIN	COBALT 2.2µg/mL	10 mL PO	22.0µg	Not on race day
TROY IRONCYL	COBALT SULFATE 1.5µg/mL	1ml/10kg PO	1.7µg	Avoid on race day
LIVAMOL (SOUTER'S)	COBALT 0.08µg/g/ VITAMIN B12 0.032g/g	25-50g PO	1.6µg	Avoid on race day
3 IRON FOR GREYHOUNDS	COBALT SULFATE 1µg/mL	4mL PO	1.5µg	Avoid on race day
VITAMAX RANVET PTY LTD	CYANOCOBALAMIN 5µg/g	4g PO	0.9µg	Avoid on race day
INCA 3 ORAL SUPPLEMENT FOR HORSES AND GREYHOUNDS	COBALT SULFATE 0.2µg/mL	4mL PO	0.3µg	Avoid on race day
VITAMIN B COMPLEX POWDER VALUE PLUS	CYANOCOBALAMIN 0.5µg/g	1.75-3.5g PO	0.1µg	Avoid on race day
VALUE PLUS LIQUID IRON	COBALT SULPHATE 1.5µg/mL	1mL/10kg PO	1.7µg	Avoid on race day
CARB-IRON CARBINE CHEMICALS	COBALT CHLORIDE 7.6µg/mL	5mL PO	17.2µg	Avoid on race day

**Q. How much Cobalt is in this injectable product and how long will it swab for?**

A. This depends on a number of factors listed above and the minimum suggested withholding period is only a guideline. Veterinary advice is recommended prior to administering any of these products. A number of products are listed below and give the amount of Cobalt administered to a 30kg greyhound if the manufacturer's maximum dosage recommendation is followed. Under the Race Day Treatment rule GAR 83A no injectable substance can be administered on race day.

Product Name	Cobalt Active Ingredients	Labelled Dose for Dogs	Upper dose for 30kg dog (Co)	Min. suggested withholding period
NV HAEMO INJECTION - CEVA ANIMAL HEALTH	COBALT SULFATE 240µg/mL   CYANOCOBALAMIN 150µg/mL	0.25-1.0 mL/10kg IM	293.3µg	Minimum 96 hours
NV V.A.M. INJECTION - CEVA ANIMAL HEALTH	COBALT SULFATE 240µg/mL   CYANOCOBALAMIN 150µg/mL	0.25-1.0mL/10kg IM	293.3µg	Minimum 96 hours
HEMO-15 VITAMIN-AMINO ACID INJECTION	COBALT GLUCONATE 700µg/mL   CYANOCOBALAMIN 150µg/mL	Not registered in dogs. 1mL IM or IV common 'off-label' dose	99.0µg	Minimum 48 hours
TROY HEMOPLEX INJECTION	COBALT GLUCONATE 700µg/mL   CYANOCOBALAMIN 150µg/mL	Not registered in dogs. 1mL IM or IV common 'off-label' dose	99.0µg	Minimum 48 hours
NV VITAMIN B12 INJECTION - CEVA ANIMAL HEALTH	CYANOCOBALAMIN 1000µg/mL	1-2mL IM	87.0µg	Minimum 48 hours
TRIPART INJECTION	CYANOCOBALAMIN 500µg/mL	0.5mL/10kg IM or SC	32.6µg	Minimum 48 hours
KYNOSELEN - MUSCULAR STIMULANT FOR HORSES AND DOGS	CYANOCOBALAMIN 250µg/mL	2-5 mL SC or IM	54.4µg	Contains Heptaminol (minimum 5 days)
TROY DYNAJEC INJECTION - MUSCULAR STIMULANT FOR HORSES AND DOGS	CYANOCOBALAMIN 250µg/mL	2-5 mL SC or IM	54.4µg	Contains Heptaminol (minimum 5 days)
TROY VITAMIN B12 INJECTION	CYANOCOBALAMIN 1000µg/mL	0.5-1.0mL IM, SC or IV	43.5µg	Minimum 48 hours

VITAMIN B12 CYANOCOBALAMIN INJECTION - LANDMARK	CYANOCOBALAMIN 1000µg/mL	0.5-1.0mL IM or SC	43.5µg	Minimum 48 hours
RICHTAFORT PHOSPHORUS 125 + VITAMIN B12 INJECTION	CYANOCOBALAMIN 50µg/mL	5mL/10kg IV, SC or IM	32.6µg	Minimum 48 hours
AMINOPLEX INJECTION	CYANOCOBALAMIN 200µg/mL	0.25-1.0mL/10kg IM or IV	26.1µg	Minimum 48 hours
COFORTA 100 INJECTABLE PHOSPHORUS SOLUTION	CYANOCOBALAMIN 50µg/mL	0.5-5mL IM or SC (50% in healthy animals)	10.9µg	Minimum 24 hours
RANVET FOLIPHOS INJECTION	CYANOCOBALAMIN 50µg/mL	0.5-5mL IM or SC (50% in healthy animals)	10.9µg	Minimum 24 hours
NV FOLIC ACID & VITAMIN B12 INJECTION	CYANOCOBALAMIN 50µg/mL	1-2mL IM	4.3µg	Minimum 24 hours
NV COPHOS B INJECTION	CYANOCOBALAMIN 50µg/mL	1mL/15kg IM	4.3µg	Minimum 24 hours
TROY B-PHOS INJECTION	CYANOCOBALAMIN 50µg/mL	1mL/15kg IM	4.3µg	Minimum 24 hours
AMINO-LITE 34X INJECTION	CYANOCOBALAMIN 0.2µg/mL	1mL/4.5kg BW IM or SC	0.1µg	Minimum 24 hours

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