

Working with the Nutraceutical Industry for the Benefit of the Athletic Community



**National Centre for Agri-food Research in Medicine, St. Boniface Hospital
Research Centre, Winnipeg, Canada**



Can We Use Nutraceuticals to Influence Athletic Performance and Participation?



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Nutraceuticals are defined (for the purposes of this talk) as any extract (from plant or animal material) that has health-related benefits beyond those obtained by normal nutritional means.

Examples: elk velvet antler, tribulus

**Not an example: caffeine,
androstenedione**



Can We Use Nutraceuticals to Influence Athletic Performance and Participation?

- ➔ Nutraceuticals are an acceptable method of aiding athletic performance (either directly or indirectly).
- ➔ Nutraceuticals are a problem for the athlete.



Nutraceuticals are an acceptable method of aiding athletic performance

- ➔ Nutraceuticals are not drugs, they are natural and healthy. What's the problem?
- ➔ Nutraceutical use is not banned by the IOC. There is no ethical or legal dilemma.
- ➔ Nutraceuticals and functional foods have health related benefits. Can you ethically deny athletes access to this form of therapy?



Nutraceuticals are a problem for the athlete

- ➔ They could induce positive drug tests and result in disqualification.
- ➔ If drugs are banned, why are performance-enhancing nutraceuticals any different?
- ➔ Nutraceutical quality may be compromised.
- ➔ Nutraceuticals may compromise the health of the athlete.



There is evidence that nutraceuticals may induce positive drug tests and their quality may be compromised.

➔ Gurley et al (Am J Health Sys Pharm 57:963-969, 2000) reported 11 of 20 ephedra supplements tested failed to list ingredient content or had >20% difference from the actual amount

➔ Ayotte reported at the Nutrition meeting associated with the World Track&Field Championships in Edmonton, 2001 that tribulus is often contaminated with testosterone, nor-testosterone and even androstenedione; 25% of ginkgo biloba preparations failed quality tests



Question:

Are nutraceuticals acceptable or not?

**The answer is not yes or no.
Instead, there are several
options:**

- ➔ Be an ostrich: Stick your head in the sand and avoid the whole issue.
- ➔ Ban the use of nutraceuticals in your team/sport/country.
- ➔ Address the issue with solid scientific investigations.



Solution:

- ➔ As scientists & administrators, we should address the problem instead of issuing across the board bans.



How do we address the scientific issues?

- ➔ Clean up the nutraceutical industry with respect to quality controls.
- ➔ Conduct well controlled clinical trials to determine:
 - a) if nutraceuticals can influence athletic performance;
 - b) if nutraceuticals can influence drug tests.



**DOPING CONTROL
URINALYSIS OF A
GINSENG EXTRACT,
COLD-F/X®[®], IN CANADIAN
ATHLETES**



**CV Technologies, a
nutraceutical company
located in Edmonton,
Canada, has produced a
ginseng extract with
documented immune
boosting effects on
colds and influenza
symptoms.**



Cold-FX® has been used routinely by members of the Edmonton Oilers Hockey Club since 1997 to enhance training by acting as an immune system booster to reduce the incidence of colds and influenza. However, during the 1998-1999 season, players who were candidates for their respective Olympic teams stopped taking Cold-FX® over concerns that the product may result in a positive doping control test. At the time, there was no data to determine if such a result could be produced.



The purpose of our study was to examine if ingestion of 400 mg/day of a North American ginseng root extract (Cold-F/X[®], CV Technologies Inc. Edmonton, Canada) had any effect on doping control urinalysis in athletes.

The Cold-F/X[®] capsules were administered 2 x 200 mg capsules/day for 28 days.



Inclusion criteria for subjects enrolled in the Cold-F/X® study

1. Normal, healthy by medical history
2. Male or Female
3. Amateur high performance athlete currently training and competing in Manitoba
4. Between the ages of 18 – 25 years
5. Willing to comply with protocol requirements for urine sampling
6. Written informed consent



Exclusion Criteria

1. Subjects must agree to not use any herbal supplements for the entire duration of the study
2. Subjects must agree to not use any IOC banned substances for the entire duration of the study
3. History of positive doping control urinalysis
4. Pregnancy



Athletes were recruited from University intramural leagues, community based programs and senior competitive leagues.

We did not recruit athletes from national sports programs.



Urine testing

Urine samples were collected under strict IOC guidelines with a certified doping control officer as a chaperone. Urine samples were labeled, stored, and shipped to the IOC accredited testing facility as per the IOC testing requirements. Urinalysis was performed at the IOC accredited testing facility in Laval, Quebec.



Results

The frequency of exercise varied from 3-12x / week.

Exercise modalities included:

swimming, ultimate frisbee, hockey, basketball, weight training, skiing, tennis, squash, aerobics, kickboxing, figure skating and karate.



Population demographics of subjects

	Age (yrs)	Height (inch)	Weight (lbs)
Females n=20	22.3 ± 0.4	64.6 ± 0.5	131.3 ± 2.3
Males n=19	23.3 ± 0.3	70.8 ± 0.6	166.4 ± 3.4



⇒ 39 out of 40 subjects completed the study.

⇒ Medication compliance was >97%



Urinalysis 28 days following Cold-F/X treatment.

	pH	Specific gravity
Females	6.46 ± 0.14	1.010 ± 0.001
Males	6.69 ± 0.20	1.013 ± 0.002



IOC banned substances that were tested

Full menu screening of ~200 banned substances within the categories of stimulants, B-agonists and blockers, narcotic analgesics, anabolic agents, diuretic agents, local anesthetics, masking agents and peptide hormones.



All 39 male and female subjects were found to have acceptable/undetectable levels of all banned substances tested.



Conclusions

- ➔ Cold-F/X® does not contain any IOC banned substances.
- ➔ Ingestion of Cold-F/X® does not induce the generation of any IOC banned substances within the body over a chronic (28 day) ingestion period.
- ➔ The substances within Cold-F/X® do not cross react with the assay conditions to produce an artificially positive doping control urinalysis.



Limitations of the Study

- ➔ The results are limited by the study duration.
- ➔ The conclusions are only applicable to this ginseng extract preparation and validity may change if product quality changes.



This study represents the first study of nutraceuticals carried out under strict IOC doping control guidelines to detect IOC banned substances in the urine from athletes.

Further studies of this nature are necessary to provide information on other nutraceuticals regarding their capacity to influence doping control urinalysis.

WHY?





For athletes

They now have confidence that the nutraceutical that they consume will not influence their participation in athletic events nor induce unknown and unwanted medical side effects.

⇒ For regulatory bodies (IOC/WADA)

They now have some basic information so that they can respond to simple inquiries from athletes on product safety and to an athlete's claims re: doping analysis results.



For industry

They now can use this as a marketing tool to promote the use of their product as a healthy, safe and legal athletic supplement.



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**St. Boniface General Hospital: Ms April
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CV Technologies Inc

**Lab de controle du dopage, Laval: Dr C
Ayotte**



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