# **Supplemental File B:**

# **Risky ingredients identified, either hidden from or present on dietary supplement labels**

| Risky ingredient either hidden from the label (a) or as listed on the label (b) | Common synonyms for ingredient | WADA 20211 | DEA Controlled Substances2 | FDA Notices | OPSS/DoD Prohibited Status\*3 | Questionable whether it should be allowable in dietary supplements |
| --- | --- | --- | --- | --- | --- | --- |
| 1-4 OHP17beta-({1-Ketoethyl}-androsta-1, 4-diene-3-one, 17a-ol) b | * 17beta-({1-Ketoethyl}-androsta-1,4-diene-3-one,17a-ol) * 1,4-OHP * 1,4-HydroxyProgesterone | - | - | - | - | Likely a synthetic compound |
| 19-Nor-5-androstenedione a | * Estr-5-ene-3,17-dione * 19-NorAndrost-5-ene-3,17-dione | - | Schedule III drug (Listed as 19-Nor-5-androstenedione (estr-5-en-3,17-dione)) | - | DoD Prohibited:  DEA: Schedule III drug |  |
| Micronized DHEA (Dehydroepiandrosterone) b | * DHEA * Dehydroepiandrosterone * Androstenolone * 5,6-Didehydroepiandrosterone * Prasterone * 3β-hydroxyandrost-5-en-17-one * 5-DHEA | S1-1 c: Anabolic Androgenic Steroids [AAS] (Listed as Prasterone (dehydroepiandrosterone, DHEA, 3β-hydroxyandrost-5-en-17-one)) | - | - | - | FDA Warning Letter: Specific to claims made on product bottles containing DHEA. 4 |
| 1-DHEA, b AND 1-androstene-3β-ol-17-one b | * 1-Androsterone * 1-DHEA / 1DHEA * 1-Dehydroepiandrosterone * 1-androstene-3β-ol-17-one * 3β-hydroxy-5α-androst-1-en-17-one * 3β-hydroxy-androst-1-ene-17-one | S1-1 c: Anabolic Androgenic Steroids [AAS] (Listed as  1-Androsterone  (3α-hydroxy-5α-androst-1-ene-17-one)) | - | - | WADA: S1-1 [AAS] | 1-Androsterone in PubChem lists 1-androstene-3β-ol-17-one as a synonym, and 1-DHEA in PubChem lists 1-androstene-3β-ol-17-one as a synonym, but it does not list 1-DHEA as directly synonymous to 1-Androsterone. it seems the chemical composition is not fully understood for 1-DHEA |
| 4-androstene-3b-ol, 17-one, b  AND  4-DHEA b | * 4-Androsterone * 4-DHEA / 4DHEA * 4-Dehydroepiandrosterone * 4-androstene-3β-ol-17-one * 3b-Hydroxy-4-androsten-17-one * 3β-hydroxyandrost-4-en-17-one   Androst-4-en-3β-ol-17-one  3b-hydroxy-androst-4-ene-17-one  4-androsten (4-androsten-3beta-ol-17-one) | - | - | - | - | 4-DHEA in PubChem lists 4-Dehydroepiandrosterone as a synonym, and 4-androstene-3b-ol, 17-one in PubChem lists 4-Dehydroepiandrosterone as a synonym but they are not listed as direct synonyms of each other. It seems the chemical composition is not fully understood for 4-DHEA |
| 19-NorAndrost-4-ene-3b-ol,17-one b | * 19-4-Nordehydroepiandrosterone * 19-nor-4-DHEA * 19-Nor-4-dehydroepiandrosterone * Estr-4-en-3β-ol-17-one * 3β-hydroxy-19-norandrost-4-ene-17-one | - | - | - | - | This is likely an anabolic steroid. |
| Unknown steroids a | - | - | - | - | - | Some steroids may be hidden that cannot be identified. |
| 19-norandrosta-4,9-diene-3,17 Dione a | * estra-4,9-diene-3,17-dione * 4,9-Esteadine-3,17-dione * methyldienedione * dienedione | - | Schedule III drug lists: 19-nor-4,9(10)-androstadienedione (estra-4,9(10)-diene-3,17-dione) | - | DoD Prohibited:  DEA: Schedule III drug | This compound is likely an anabolic steroid. 5 19-nor-4,9(10)-androstadienedione (estra-4,9(10)-diene-3,17-dione) |
| Epiandrosterone b | * 3-hydroxy-androstane-17-one * trans-Androsterone * Isoandrosterone * 3-Epiandrosterone * Epi-Andro * 3β-Hydroxy-5α-androstan-17-one * 5α-Androstan-3β-ol-17-one * 3β-hydroxy-5α-androstan-17-one azine * 3β-androsterone | S1-1 c: Anabolic Androgenic Steroids [AAS] (Listed as Epiandrosterone (3β-hydroxy-5α-androstan17-one)) | - | - | WADA: S1-1 [AAS] |  |
| Androstenedione a /  AND  Androstenedione type of compounds a | * 4-androstenedione * Δ4-dione * androst-4-ene-3,17-dione * 4-Androstene-3,17-dione * 17-Ketotestosterone * ADIONE * Other types of compounds: 5-Androstenedione (androst-5-en-3,17-dione), 1-Androstenedione (5alpha-androst-1-en-3,17-dione) | S1-1 c: Anabolic Androgenic Steroids [AAS] (Listed as Androstenedione (androst-4-ene-3,17- dione, 1-Androstenedione (5α-androst-1-ene-3,  17-dione, 5-Androstenedione (androst-5-en-3,17-dione) | Schedule III drug (Listed as 4-Androstenedione (androst-4-en-3,17-dione, 5-Androstenedione (androst-5-en-3,17-dione), 1-Androstenedione (5alpha-androst-1-en-3,17-dione) | FDA Structure Category: Steroid (Listed as 4-androstenedione)6 | DoD Prohibited:  DEA: Schedule III drug |  |
| androstadienedionea | * 1, 4-androstadiene-3, 17-Dione * Boldione * 1,4-AD | S1-1 c: Anabolic Androgenic Steroids [AAS] (Listed as Boldione (androsta-1,4-diene-3,17-dione) | Schedule III drug (Listed as Boldione) | - | DoD Prohibited:  DEA: Schedule III drug |  |
| 5α-Hydroxy Laxogenin Acetateb | * 5-Alpha-Hydroxy-Laxogenin * 5a-Hydroxy-Laxogenin * (25R)-3beta,5alpha-Dihydroxyspirostan-6-one * Spirostan-6-one, 3,5-dihydroxy-, (3beta,5alpha,25R)- * Spirostan-6-one, 3,5-dihydroxy-, (3b,5a,25R)- * 25R,5alpha-Spirostan-3beta,5-diol-6-one * 25-R-Spirostan-5A-Diol-6-One-3-One * 25R Spirostan-5a-diol-6-one-3-one Decanoate * 25R spirostan-5a-diol-6-one -3-one Undecanoate | - | - | FDA Advisory List: 5-alpha-hydroxy laxogenin7 | FDA Advisory List | 5α-Hydroxy Laxogeninwas not detected but **diosgenin, delta4-diosgenone, and**  **Laxogenin derivatives** were detecteda |
| 3,5-diiodo-l-thyronine b | * 3,5-Diiodothyronine * 3,5-T2 * T2 | - | - | FDA Notice: “Does not meet the definition of a dietary ingredient”8 | - |  |
| Demelverine a (Methphenethamine) | * N-methyl-N-phenethyl-2-phenylethanamine * N-Methyldiphenethylamine * N-Methyl-β,β-diphenyldiethylamine | S6-B d: Specified Stimulants (Listed as Phenethylamine and its derivatives) | - | - | - | Synthetic compound |
| Hordenine HCl b | * Anhaline * Eremursine * N,N-Dimethyl-2-(4-hydroxyphenyl)ethylamine * N,N-dimethyltyramine * Peyocactine * Cactine * p-hydroxy-N,N-dimethylphenethylamine * 4-[2-(Dimethylamino)ehtyl]phenol * 2-(4-hydroxyphenyl)N,Ndimethyl – Ethylamine * Ordenine * N,N-Dimethyl-4-hydroxy-beta-phenethylamine | S6-B d: Specified Stimulants (Listed as Phenethylamine and its derivatives) | - | FDA Advisory List: does not appear to be lawful ingredient in dietary supplements7 | FDA Advisory List |  |
| Huperzia A (Toothed Clubmoss (*Huperzia serrata* aerial parts extract) b  AND  Huperzine A [(from toothed Clubmoss (Huperzia serrata) aerial parts extract] b AND Huperzia serrate (aerial parts) Extract Standardized to 1% Huperzia A b AND Huperzia A (from Toothed Clubmoss (Huperzia serrata aerial parts extract) b AND Huperzia serrata Extract powder (Huperzia serrata) (whole herb) b AND Huperzine A (Huperzia Serrata) b | * Huperzine A * HupA | - | - | - | - | Considered a drug in some countries.9 |
| Hydroxyepianderosterone a | - | - | - | - | - | This may be an incomplete name and analyses could not identify which kind of epianderosterone it was |
| [Isopropylnorsynephrine b](https://www.opss.org/dietary-supplement-ingredients-prohibited-department-defense) | * Isopropyloctopamine * Betaphrine * Deterenol * N-isopropylnorsynephrine * N-isopropyloctopamine | - | - | FDA Notice: “Betaphrine” is not a dietary ingredient10 | DoD Prohibited: Listed as Isopropylnorsynephrine (including common synonyms) |  |
| N Methyl Tyramine b | * NMT * Methyl-4-tyramine * N-Methyltyramine * P-(2-Methylaminoethyl)phenol * N-Methyl-Tyramine * 4-Hydroxy-N-methylphenethylamine * P-(2-(Methylamino)ethyl)phenol * P-(2-Methylaminoethyl)-phenol | - | - | FDA Advisory List does not appear to be lawful ingredient in dietary supplements7 | FDA Advisory List |  |
| Octodrine HCl b | * DMHA * Dimethylhexylamine * 1,5-Dimethylhexylamine * 1,5-DMHA * 2-amino-5-methylheptane * 2-amino-6-methylheptane * 2-aminoisoheptane * 2-Heptylamine, 6-methyl- * 2-Isooctyl amine * 2-Metil-6-amino-eptano * 6-Amino-2-methylheptane * Amidrine * Octodrine * Vaporpac | S6-B d: Listed as Octodrine (1,5-dimethylhexylamine)) | - | FDA Notice and Warnings: *The FDA is not aware of any information demonstrating that DMHA was lawfully marketed as a dietary ingredient* prior to 1994 and there exists no documentation for DMHA as a new dietary ingredient11 | DoD Prohibited: Listed as DMHA (including all Common synonyms)3 |  |
| PEAs (Includes: Beta Phenethylamine HCl b AND N-Phenethyl Dimethylamine/ N-Phenethyl- Dimethylamine b AND Beta Phenylethylamine b) | * PEA * β-PEA * β-phenethylamine * Phenylethylamine * β-phenylethylamine | S6-B d: Specified Stimulants (Listed as Phenethylamine and its derivatives) | - | - | - | PEAs are stimulant substances with structures similar to amphetamine, catecholamines, and other substances. |
| Pregnenolone b | * pregn-5-en-3β-ol-20-one * P5 * 5-Pregnenolone * δ5-Pregnene-3β-ol-20-one * Pregn-5-en-3β-ol-20-one | - | - | FDA Unapproved drug12 | FDA Unapproved drug3 |  |
| Synephrine b | * p-Synephrine * Oxedrine * Parasympatol * Synephrine HCl | On the 2021 Monitoring Program & not considered a Prohibited Substance; stimulant | - | FDA Warning Letter: Problematic in unnatural amounts13 | - | Could be made in a laboratory; National Collegiate Athletic Association (NCAA) bans synephrine. |
| Theophylline b | * 1,3-Dimethylxanthine * Elixophyllin | - | - | Available as a prescription [Drug](https://www.fda.gov/drugs/drug-interactions-labeling/preventable-adverse-drug-reactions-focus-drug-interactions)14,15 | - | Stimulant and smooth muscle relaxant, in cocoa, and tea leaves. Can be found in plant materials in lower amounts (allowed from plants); prepared synthetically (NOT allowed as a prescription drug). |
| Vinpocetine b | * Ethyl apovincaminate | - | - | On September 6, 2016 FDA announced its tentative conclusion vinpocetine does not meet the definition of a dietary ingredient16 | DoD Prohibited: Listed as: Vinpocetine (including all Common synonyms)3 |  |
| Yohimbine HCl b or  Yohimbe Extract (bark) b and Yohimbe extract (as *Pausinystalia yohimbe*) (bark) Standardized for 6% yohimbine Supplying rauwolscine b AND Yohimbe extract (as  *Pausinystalia yohimbe*)(bark)  supplying yohimbe b AND Yohimbe Extract (bark) b AND *Rauwolfia vomitoria* Extract (std. min. 90% alpha yohimbine) (rootbark) b AND Alpha Yohimbine b | * yohimbine is also known as quebrachine | - | - | Yohimbine is dangerous at high levels. Doses of 5-10 mg have been marketed as a prescription drug. These doses are much greater than those found naturally in yohimbe bark.17,18,19,20,21 | - | Yohimbine is banned for use in supplements in a number of countries, and should not be in dietary supplements at doses comparable to prescription drugs.22, 23 |

**Footnotes**: a = Risky Ingredients hidden from label; b = Risky Ingredients present on the label; c = WADA Prohibited at All Times; d = WADA Prohibited in Competition.

**\*OPSS/DoD Prohibited Ingredients: Ingredients in products labeled as dietary supplements that FDA or the U.S. Armed Services have disallowed**for one reason or other. In addition, all prescription drugs and controlled substances are not permitted for use in or as dietary supplements. Most recently, a proposed Department of Defense instruction on dietary supplements outlines changes to the current OPSS Prohibited list to include select substances on the WADA list (S0-S5) and those currently on the FDA Dietary Supplement Ingredient Advisory list. Further, substances can be added to the OPSS Prohibited List, with approval by the DoD Nutrition Committee, when submitted by the OPSS Advisory Board as posing a significant threat to the health and readiness of our force.

**References Cited**

1. “World Anti-Doping Code International Standard Prohibited List 2021.” *World Anti-Doping Agency*, WADA 2021, [www.wada-ama.org/sites/default/files/resources/files/2021list\_en.pdf](http://www.wada-ama.org/sites/default/files/resources/files/2021list_en.pdf).
2. U.S. Department of Justice. “Controlled Substances - Alphabetical Order -.” *Drug Enforcement Agency*, 2 Apr. 2021, deadiversion.usdoj.gov/schedules/orangebook/c\_cs\_alpha.pdf.
3. Consortium for Health and Military Performance (CHAMP). “Dietary Supplement Ingredients Prohibited by the Department of Defense.” *Operation Supplement Safety (OPSS)*, Uniformed Services University (USU), www.opss.org/dietary-supplement-ingredients-prohibited-department-defense.
4. Los Angeles District Office, United States. “The Delano Company, Inc. Dba LifeLink - 553572 - 09/07/2018.” *U.S. Food and Drug Administration*, 7 Sept. 2018, www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/warning-letters/delano-company-inc-dba-lifelink-553572-09072018.
5. Scarth JP, Clarke AD, Teale P, Pearce CM. “Comparative in Vitro Metabolism of the ‘Designer’ Steroid Estra-4,9-Diene-3,17-Dione between the Equine, Canine and Human: Identification of Target Metabolites for Use in Sports Doping Control.” *Steroids*, vol. 75, no. 10, 2010, pp. 643–52, doi:10.1016/j.steroids.2010.03.010.
6. U.S. Food & Drug Administration. “Androgen-Receptor-Binding Dataset-(Binding-Data).” *U.S. Food & Drug Administration*, U.S. Food & Drug Administration, www.fda.gov/media/74986/download.
7. U.S. Food & Drug Administration. “Dietary Supplement Ingredient Advisory List.” *U.S. Food and Drug Administration*, U.S. Food & Drug Administration, 16 Dec. 2019, www.fda.gov/food/dietary-supplement-products-ingredients/dietary-supplement-ingredient-advisory-list.
8. Food and Drug Administration. “NDI 731, 3,5-Diiodo-L-Thryonine and Proprietary Wellness.” *Regulations.Gov Your Voice in Federal Decision Making*, Regulations.gov, 27 Dec. 2012, www.regulations.gov/document/FDA-2012-S-1178-0012.
9. Consortium for Health and Military Performance (CHAMP). “Huperzine A: Dietary Supplements for Brain Health.” *Operation Supplement Safety (OPSS)*, Uniformed Services University (USU), 11 June 2020, www.opss.org/article/huperzine-dietary-supplements-brain-health.
10. Food and Drug Administration. “NDI 258 - Betaphine (Isopropyl Octopamine) from Syntech (SSPF) International, Inc.” *Regulations.Gov Your Voice in Federal Decision Making*, Regulations.gov, 13 Jan. 2017, www.regulations.gov/document/FDA-2005-S-0518-0010.
11. U.S. Food and Drug Administration. “DMHA in Dietary Supplements.” *U.S. Food and Drug Administration*, 29 Apr. 2019, www.fda.gov/food/dietary-supplement-products-ingredients/dmha-dietary-supplements.
12. U.S. Food and Drug Administration. “American Hormones, Inc. 1/10/2008.” *U.S. Food and Drug Administration*, 12 Jan. 2017, wayback.archive-it.org/7993/20170112024717/http://www.fda.gov/Drugs/GuidanceComplianceRegulatoryInformation/PharmacyCompounding/ucm155170.htm.
13. U.S. Food & Drug Administration. “Warning Letter: 1ViZN LLC - 522724 - 08/23/2017.” *U.S. Food and Drug Administration*, 23 Aug. 2017, www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/warning-letters/1vizn-llc-522724-08232017.
14. U.S. Food & Drug Administration. “Preventable Adverse Drug Reactions: A Focus on Drug Interactions.” *U.S. Food and Drug Administration*, 6 Mar. 2018, www.fda.gov/drugs/drug-interactions-labeling/preventable-adverse-drug-reactions-focus-drug-interactions.
15. MedlinePlus. “Theophylline: MedlinePlus Drug Information.” *MedlinePlus: Trusted Health Information for You*, The American Society of Health-System Pharmacists, 16 Apr. 2021, medlineplus.gov/druginfo/meds/a681006.html.
16. U.S. Food and Drug Administration. “Dietary Supplement Products & Ingredients.” *U.S. Food and Drug Administration*, 13 Oct. 2020, www.fda.gov/food/dietary-supplements/dietary-supplement-products-ingredients.
17. U. S. Food and Drug Administration Florida District. “Form FDA 483: Complete Pharmacy & Medical Solutions, LLC.” *Dept. of Health and Human Services*, Food and Drug Administration, 23 Feb. 2017, www.fda.gov/media/123196/download.
18. U. S. Food and Drug Administration Florida District. “Form FDA 483: Complete Pharmacy & Medical Solutions, LLC.” *Dept. of Health and Human Services*, Food and Drug Administration, 23 Feb. 2017, [www.fda.gov/media/104437/download](http://www.fda.gov/media/104437/download).
19. Mueller EM, Lambert JR, Agila Sefen JA. “Form FDA 483: Essential Pharmacy Compounding.” *Dept. of Health and Human Services*, Food and Drug Administration, 22 May. 2015, www.fda.gov/media/92288/download.
20. U.S. Food & Drug Administration. “FDA Advises Consumers to Avoid Green Gorilla Root Juice Due to a Potentially Harmful Undeclared Ingredient.” *U.S. Food and Drug Administration*, 18 Dec. 2020, www.fda.gov/food/alerts-advisories-safety-information/fda-advises-consumers-avoid-green-gorilla-root-juice-due-potentially-harmful-undeclared-ingredient.
21. Welsh C. “Public Meeting to Discuss the Development of a List of Pre-DSHEA Dietary Ingredients.” *Food and Drug Administration*, 3 Oct. 2017, www.fda.gov/media/108452/download.
22. Food and Drug Administration. “Import Alert 66–60.” *Food and Drug Administration*, 23 Apr. 2019, www.accessdata.fda.gov/cms\_ia/importalert\_198.html.
23. Consortium for Health and Military Performance (CHAMP). “Yohimbe and Yohimbine in Dietary Supplement Products.” *Operation Supplement Safety (OPSS)*, Uniformed Services University (USU), 7 Jan. 2021, [www.opss.org/article/yohimbe-and-yohimbine-dietary-supplement-products](http://www.opss.org/article/yohimbe-and-yohimbine-dietary-supplement-products).