

1 **Potential Risks of Consuming Energy Drinks**
2 **and The Effects of Caffeine Metabolites on Human Body**

3 許家銘(5128)

4 03/20/2024

5 **Outline**

- 6 1. Introduction
7 2. Assessment of the potential health risks of caffeine, D-glucuronolactone and taurine in
8 energy drinks on the human body
9 3. Assessment the effects of paraxanthine in caffeine on human cognitive function
10 4. Conclusion

11 **Abstract**

12 The consumption of energy drinks (EDs) is increasing globally while the evidence and
13 concern about the potential health risks are also growing. Caffeine (generally 32 mg/100 mL)
14 together with a wide variety of other active components such as taurine (usually 4000 mg/L)
15 and D-glucuronolactone (generally 2400 mg/L) are the main ingredients of EDs. Paraxanthine
16 (PXN) is a metabolite of caffeine that has recently been reported to enhance cognition at a dose
17 of 200 mg. In the study, assess the exposures to caffeine, taurine and D-glucuronolactone from
18 EDs in various consumption scenarios and consumer profiles and to characterize the risks by
19 evaluating caffeine and taurine intakes with their reference values and by calculating the
20 margin of safety (MOS) for D-glucuronolactone. Another article method is employing a double
21 blind, placebo-controlled, crossover, and counterbalanced manner, 12 healthy male and female
22 volunteers ingested a placebo (PLA) or PXN. With each treatment experiment, participants
23 completed side effect questionnaires and donated a fasting blood sample. Participants then
24 performed a series of tests assessing cognition, executive function, memory, and reaction time.
25 Among them, Rubio research results show that consumers with a body weight of 40 kg need to
26 pay attention to the ED volume when consuming caffeine, taurine, and D-glucuronolactone.
27 Intakes exceeding 250 mL of caffeine and D-glucuronolactone will There is a risk of sleep
28 disorder, and the result exceeds $MOS < 100$, and the intake of taurine exceeding 500 mL exceeds
29 the EFSA recommended intake. while Xing results Cognitive function test results include
30 Berg-wisconsin card sorting task test (BCST) test, Go/No-Go (GNG) test, Sternberg task test
31 (STT) test, and Psychomotor vigilance task test (PVT), all indicating that the reaction time is
32 Improves concentration. The study of this topic is to evaluate the impact and potential risks of
33 consuming energy drinks on the human body. First, the first document evaluates the risks of
34 the ingredients of energy drinks, while the second document explores the effects of PXN on
35 human cognitive function and evaluates the intake of PXN whether cognitive function can be
36 improved.

References

- 1
- 2 Rubio C, Cámara M, Giner RM, González–Muñoz MJ, López–García E, Morales FJ, Moreno–
3 Arribas MV, Portillo MP, Bethencourt E, 2022, Caffeine, D–glucuronolactone and taurine
4 content in energy drinks: exposure and risk assessment, *Nutrients*, 14(23): 5103
- 5 Xing DT, Yoo C, Gonzalez D, Jenkink V, Nottingham K, Dickerson B, Leonard M, Ko JB,
6 Faries M, Kephart W, Purpura M, Jaeger R, Wells SD, Sowinski R, Rasmussen CJ, Kerider
7 RB, 2022, Dose-Response of Paraxanthine on Cognitive Function: A Double Blind,
8 Placebo Controlled, Crossover Trial, *Nutrients*, 13(12): 4478