Innovative Energy Drink Formulated With Natural Extracts for Diverse Demographics and Occupational Needs

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Energy drinks are very popular; however, excessive consumption has been linked to various health risks, including anxiety, dehydration, and cardiovascular complications. This study aimed to develop a safer, natural alternative to commercial energy drinks by incorporating organic extracts. The proposed energy drink formulation includes caffeine extracted from Robusta coffee, HSYA extract derived from safflower flower pods, energy-enhancing compounds such as Co-Q10 and creatine, and balanced essential vitamins (B6, B5, B2), minerals, electrolytes, and amino acids to ensure efficacy. Comprehensive laboratory tests were conducted to evaluate the drink's safety and quality, including assessments of chemical and microbial toxicity, solubility, stability, and acid-regulating properties. Preliminary results confirmed the drink's safety and compliance with Gulf standards for low-calorie beverages. Furthermore, animal studies on large and small animals (hybrid horses and rabbits) demonstrated the drink's positive effects, including reduced aggressiveness, improved sleep patterns, and favorable changes in liver enzymes, urine composition, and blood acidity levels. A pilot version of a smart refrigerator and a smart laboratory device has been developed to determine eligibility for buying and safety. The smart refrigerator allows access based on predefined health criteria. Meanwhile, the smart device analyzes urine samples after consuming energy drinks to indicate safety. The study recommends further refinement to create tailored versions for specific demographic groups— the elderly, athletes, students, and shift workers — ensuring optimal benefits for each population. This research presents a promising, health-conscious alternative to conventional energy drinks, offering a safe and

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