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U.S. DEPARTMENT OF AGRICULTURE

Maple Makes In Roads with Athletes

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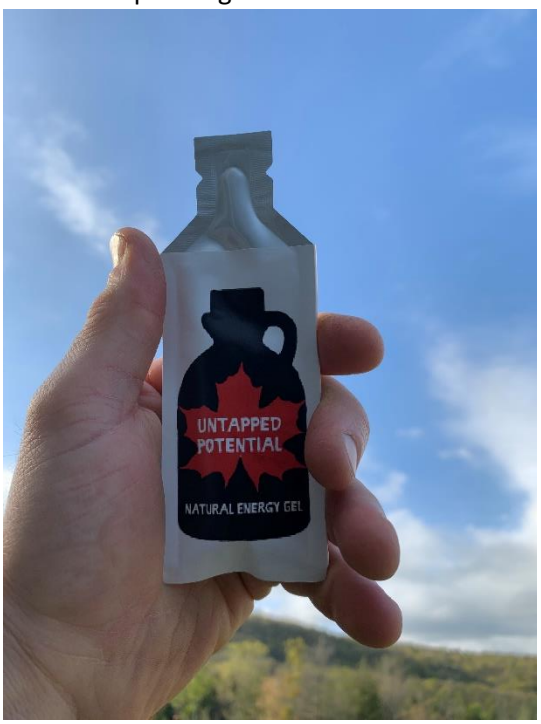

The sports nutrition market is a growing industry with potential opportunities for maple products. One area well-suited to maple is the sports gel product segment. This winter the Cornell Maple Program worked with the Cornell Department of Food Science to develop a maple sports gel formulation. The resulting product is a maple syrup-based nutrition supplement in a single serve foil pack with added electrolytes and outstanding flavor. Endurance athletics are an increasingly popular pastime in the United States, with strong links to cultural trends in health and fitness. Subsequently, the athletic gear industry has experienced a period of sustained growth. The running gear market alone is projected to grow to $23 billion annually in the next five years. Sports supplements, in the form of snacks and beverages, make up a significant portion of that market.

Sports gels are thick, carbohydrate-based, jelly-like substances that provide energy and promote recovery. In addition to calorie replacement, sports gels benefit athletes by providing much needed electrolytes, caffeine, and amino acids. They are meant to be consumed while moving and are therefore packaged in small, portable containers. For example, a marathon runner might carry these packs in a pocket and consume one every 5 miles during a race to maintain energy and avoid fatigue. Gel packs are growing in popularity and sell for as much as $3 per 100 calorie serving.

However, runners commonly complain about the flavor and consistency of these products. In sensory trials conducted to assess gels currently available in the marketplace, nine products were tested against a very simple metric: each taste tester was asked if they could finish the entire 1.5 ounce sample. Only two of the nine were deemed good enough to finish by a majority of panelists, and four of the nine were so bad that none of the panelists could finish their sample. The high demand for these products, coupled with the low quality of products currently in the marketplace, creates an opportunity for a superior, maple-based product.

This January, the Cornell Maple Program teamed up with seven seniors from the Department of Food Science to create a maple-based sports gel. The objective was to create a gel with maple as the primary component, a palatable texture and favorable flavor.

After several months of market research and sensory evaluations, the team focused on product development. They targeted their efforts on three product attributes: flavor, nutrition and consistency. Flavor is an important characteristic for energy gels. Endurance athletes are often under extreme stress while consuming gels, so the product must be highly palatable to avoid causing gastric distress. The students tested flavors known to complement maple in other products including vanilla, lemon and cinnamon. Based on an internal sensory evaluation, cinnamon was found to have the best flavor profile

among the three. The addition of cinnamon adds complexity to the flavor profile and tempers the sweetness of the syrup.

Maple syrup alone has many desirable nutritional qualities for a sports gel formulation including easily digestible sugars, along with potassium, calcium and magnesium. Additionally, researchers have identified potential anti-inflammatory compounds in maple syrup; a property that is likely to appeal to athletes. A high-quality electrolyte powder was added to the gel formulation to boost electrolytes to a level comparable to the market standard. Added electrolytes included sodium, calcium, potassium, phosphorus and magnesium.

Lastly, several thickening agents were tested to improve the consistency of the gel. Maple alone has a low viscosity compared to sports gels. This creates problems of spillage during use and results in a messy product when used on-the-go. Chia seed powder was identified as the best gelling agent based on the functional and nutritional benefits it can offer. Chia powder creates a desirable, thick texture due to its excellent water binding qualities. In a performance gel application, the chia-based gel feels firm in the packaging, but is easily consumed as a semi-thick liquid once pressure is applied to squeeze the product out of the packaging.

The final product formulation has favorable consistency and a delicious flavor reminiscent of French toast. Initial sensory tests have shown positive results with high ratings from most taste testers. Additional market and sensory tests are planned for the future. However, in initial trials taste testers have unanimously agreed that the maple gel is far superior in flavor and consistency to products currently on the market.

The process plan is relatively simple and includes a hot water bath sterilization process. Shelf stability tests indicated no growth of yeast or mold and a favorable water activity value, suggesting a stable product with long shelf life.

Using premium ingredients, the cost of supplies for the sample formulation was $0.81 per 39gram serving. A reasonable target retail price for this product is $2.50 per unit. However, because this sports gel is not a pure maple product, it would require an approved process and certified production facilities to manufacture for legal sale. Nevertheless, development of this product and other maple-based sports supplements may be a path to lucrative markets for maple producers.

A detailed report and sample formulation will be made available soon on cornellmaple.com. This product was created as part of an ongoing effort by the Cornell Maple program to develop new-value added maple products. Questions regarding maple sports gel or other value-added product opportunities can be directed to Aaron Wightman at arw6@cornell.edu.

The Cornell Maple Program would like to acknowledge the following student researchers for their effort on this project: Sean Dolan, Margaret Jones, Lyndsay Orlando, Margot Shumaker, and Jacky Zong.

Funding for this project was made possible by a cooperative agreement from the U.S. Department of Agriculture (USDA) Agriculture Marketing Service. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.