Frozen Matcha Dairy Bar

Healthy snacking gets a new twist with a high-protein, dairy-rich frozen delight. These unique frozen sandwiches feature a filling based on Greek yogurt and milk protein isolate, flavored with matcha green tea and wedged between crispy oat wafers. Containing 15g of protein from high-quality U.S. Dairy, these are perfect for breakfast on the go or for a high-protein snack—great for kids or a post-workout source of protein that helps you cool off and replenish.

MARKET INSIGHTS

- Consumers perceive yogurt as a natural, healthy product and are incorporating it at more occasions, resulting in yogurt sales trending upwards. Market volume is projected to increase 11% from 2016 to 2018 globally, including retail and out of home consumption. (Innova Market Insights, "Consumer Insights: Yogurt," May 2016).
- Dairy products and ingredients provide a mild flavor that makes a good base for trendy flavors, like matcha, as the intended tastes and colors are not overwhelmed.
- Time pressures and less meal planning are impacting food rituals, as 91% of U.S. consumers report snacking multiple times a day and 8% forgo meals altogether in favor of all-day snacking.²

INGREDIENTS (OAT WAFER)

	Usage Levels (%)
Brown sugar, light	29.14
Oats, rolled	25.51
Whole wheat flour	18.73
Egg whites	16.65
Canola oil	5.27
Modified tapioca starch	2.66
Vanilla extract	1.02
Baking soda	1.02
Total	100.00

INGREDIENTS (FILLING)

	Usage Levels (%)
Milk protein isolate 85	25.73
Yogurt, plain, Greek, nonfat	17.42
Heavy whipping cream	14.40
Milk, skim	12.43
Sugar, granulated	11.42
Egg yolks	8.72
Water	6.81
Matcha powder	2.58
Carrageenan, iota	0.49
Total	100.00

INGREDIENTS (COMPLETE BAR)

	Usage Levels (%)
Oat wafer	23.57
Filling	76.43
Total	100.00

INGREDIENTS: Milk protein isolate, nonfat Greek yogurt, heavy cream, skim milk, sugar, water, pasteurized egg yolk, brown sugar, rolled oats, whole wheat flour, egg white, matcha, canola oil, modified tapioca starch, carrageenan, vanilla extract, baking soda

Contains: milk, egg, wheat



BENEFITS OF USING U.S. DAIRY

Milk protein isolate 85

- Adds dairy protein, calcium, magnesium and potassium to boost nutrition, which may reduce the need for additional fortification
- Provides protein enhancement and a complementary and clean dairy flavor without adding significant levels of lactose
- Offers emulsification, foaming and whipping, heat stability and water-binding characteristics

Greek-style nonfat yogurt

- A functional ingredient that delivers nutritional value, flavor and texture
- · Contains important nutrients found in milk, such as protein and calcium

Heavy cream

Provides creamy texture and smooth mouthfeel, and rich dairy notes that
 complement flavors

Per 100g

Skim milk

U.S. Label

 Contributes to nutrient value with protein and calcium while enhancing viscosity

NUTRITIONAL CONTENT

Serving Size 1 bar (70g) mount Per Serving Calories 180 Calories from Fat 5 % Daily Value total Fat 6g 99 Saturated Fat 2.5g 139 Trans Fat 0g Cholesterol 70mg 239 codium 75mg 39 cotassium 100mg 39 cotassium 200mg 39 cotassium 200mg 39 cotassium 200mg 39 cotassium 200mg 39 cotal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g Protein 15g 309 Altamin A 4% • Vitamin C 0% Calories 2,000 a 2,000 calorie needs Calories 2,000 a 2,500 cotal Fat Less than 20g 25g holesterol Less than 300mg 300mg 2400m	Nutritio	. Facte
calories 180 Calories from Fat 5 % Daily Value % Daily Value otal Fat 6g 9% Trans Fat 0g 73 cholesterol 70mg 23% codium 75mg 39 otal Carbohydrate 18g fotal Carbohydrate 18g joidium 75mg 30% cotal Carbohydrate 18g fotal Carbohydrate 9% Sugars 12g 9% Protein 15g 30% Phosphorus 20% Magnesium 6% Phosphorus 20% Magnesium 6% Saturated Fat Less than 6% Saturated Fat Less than 5% 80g Saturated Fat Less than 2% 25g holesterol Less than 300mg 300mg colium Less than 300mg 300mg		
Calories from Fat 5 % Daily Value fotal Fat 6g 99 Saturated Fat 2.5g 139 Trans Fat 0g 23% Sodium 75mg 39 fotassium 100mg 39 fotal Carbohydrate 18g Dietary Fiber 1g 49 Sugars 12g 30% Protein 15g 30% Aftamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Porterin 1g 20 Saturated Fat Less than 65g 80g Saturated Fat Less than 52g 25g otal Fat Less than 52g 25g solature Less than 300mg 300mg solaterol Less than 300mg 300mg		ug)
% Daily Value iotal Fat 6g 99 Saturated Fat 2.5g 139 Trans Fat 0g 239 iodium 75mg 39 iodium 75mg 39 iodium 75mg 39 iotassium 100mg 39 iotassium 100mg 39 iotal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g 9 Protein 15g 309 /itamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Parcent Daily Values are based on a 2,000 calor 2,000 color calories 2,000 calorie needs 2,000 calorie needs calories 2,000 calorie needs 2,000 calorie needs 2,000 calorie needs calartated Fat Less than 300mg 300	Amount Per Serving	
otal Fat 6g 9% Saturated Fat 2.5g 13% Trans Fat 0g 13% Cholesterol 70mg 23% Sodium 75mg 3% Sodium 75mg 3% Sotassium 100mg 3% Sotassium 100mg 3% Sotassium 100mg 3% Sotassium 100mg 3% Sugars 12g 4% Protein 15g 30% Vitamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Calories 2.000 Calories 2.000 Calories 2.000 Saturated Fat Less than Soturate Jetsorie 5% Soturate Jetsorie 2.400mg Less than 2.400mg Soturate Storie 2.400mg	Calories 180 Ca	lories from Fat 50
Saturated Fat 2.5g 139 Trans Fat 0g Cholesterol 70mg 239 Sodium 75mg 39 Potassium 100mg 39 Sotal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g Protein 15g 309 fitamin A 4% • Vitamin C 0% Calcium 35% • Iron 4% Phosphorus 20% • Magnesium 6% Phosphorus 20% • Magnesium 6% Prosphorus 20% • Magnesium 6% Calories: 2,000 2,500 tel Fat Less than 55g 80g Saturated Fat Less than 52g 25g holesterol Less than 300mg 300mg 2,400mg 2,400mg 2,400mg		% Daily Value
Trans Fat 0g Trans Fat 00mg State 18g Total Carbohydrate Sugars 12g Trotein 15g State 18g Trotein 18g	Total Fat 6g	9%
cholesterol 70mg 239 codium 75mg 39 codium 75mg 39 cotassium 100mg 39 cotal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g 49 Protein 15g 30% //itamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Percent Daily Values are based on a 2.000 calori 2,000 calories: 2,000 2,500 otal Fat Less than 56g 80g Saturated Fat Less than 300mg 300mg Less than 300mg 300mg 300mg	Saturated Fat 2.5	13 %
Joidium 75mg 39 Joidium 75mg 39 Joitassium 100mg 39 Joitassium 100mg 39 Joital Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g 49 Protein 15g 309 //itamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Percent Daily Values are based on a 2.000 calori 2,500 otal Fat Less than 65g Saturated Fat Less than 25g holesterol Less than 300mg odium Less than 2,400m	Trans Fat 0g	
otassium 100mg 39 otal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g Protein 15g 309 //itamin A 4% Vitamin C 0% Calcium 35% Iron 4% Phosphorus 20% Magnesium 6% Percent Daily Values are based on a 2.000 calori 2,500 otal Fat Less than 55g Saturated Fat Less than 20g Less than 300mg 300mg odium Less than 300mg odium Less than 300mg	Cholesterol 70mg	23%
ortal Carbohydrate 18g 69 Dietary Fiber 1g 49 Sugars 12g 9 Protein 15g 309 Protein 15g 309 Protein 15g 309 Protein 200% Nagnesium 6% Prosphorus 20% Magnesium 6% Percent Daily Values are based on a 2.000 calori 2,000 Patriat Less than 55g 80g Saturated Fat Less than 20g Saturated Fat Less than 300mg Less than 2,400mg 2,400m	Sodium 75mg	3%
Dietary Fiber 1g 49 Sugars 12g Protein 15g 309 (itamin A 4% • Vitamin C 0% Calcium 35% • Iron 4% Phosphorus 20% • Magnesium 6% Percent Daily Values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori tet Your daily values are based on a 2,000 calori Saturated Fat Less than 55g 80g Saturated Fat Less than 300mg 300mg olium Less than 2,400mg 2,400m	Potassium 100mg	3%
Sugars 12g Protein 15g 30% Protein 15g 30% Protein 15g 30% Prosphorus 20% Magnesium 6% Percent Daily Values are based on a 2.000 calori et Your daily values may be higher or lower calories: 2.000 2.500 cal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg	Fotal Carbohydrate	18g 6%
Protein 15g 30% /itamin A 4% • Vitamin C 0% Calcium 35% • Iron 4% Phosphorus 20% • Magnesium 6% Percent Daily Values are based on a 2.000 calori exercation 10% epending on your calorie needs: 2.000 2.500 calories: 2.000 2.500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg colum Less than 2.400mg 2.400mg	Dietary Fiber 1g	4%
/itamin A 4% • Vitamin C 0% Calcium 35% • Iron 4% Phosphorus 20% • Magnesium 6% acrent Daily Values are based on a 2.000 calori acrent Califore needs. Calories: 2.000 2.500 ctal Fat Less than 65g 80g Saturated Fat Less than 22 25g holesterol Less than 300mg 300mg 300mg	Sugars 12g	
Calcium 35% Iron 4% *hosphorus 20% Magnesium 6% Percent Daily Values are based on a 2,000 calori Values are based on a 2,000 calori epending on your calorie needs: 2,000 2,500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg odium Less than 2,400m 2,400m	Protein 15g	30%
Calcium 35% Iron 4% *hosphorus 20% Magnesium 6% Percent Daily Values are based on a 2,000 calori Values are based on a 2,000 calori epending on your calorie needs: 2,000 2,500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg odium Less than 2,400m 2,400m	C1 . 0 404	
Phosphorus 20% Magnesium 6% Percent Daily Values are based on a 2,000 calori 2,000 calori jett Audity values may be higher or lower epending on your calorie needs: calories: 2,000 2,500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg 300mg		
Percent Daily Values are based on a 2,000 calori let. Your daily values may be higher or lower epending on your calorie needs: Calories: 2,000 2,500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg odium Less than 2,400mg 2,400m		
iet. Your daily values may be higher or lower epending on your calorie needs: Calories: 2,000 2,500 otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg 2,400m		0
otal Fat Less than 65g 80g Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg odium Less than 2,400mg 2,400m	liet. Your daily values may	be higher or lower
Saturated Fat Less than 20g 25g holesterol Less than 300mg 300mg odium Less than 2,400mg 2,400mg		
holesterol Less than 300mg 300mg odium Less than 2,400mg 2,400mg		
	Cholesterol Less than	300mg 300mg
	^o otassium Fotal Carbohvdrate	
	Dietary Fiber	
	Protein	
alories per gram: Fat 9 • Carbohydrate 4 • Protein 4	Calories per gram:	

Calories	266kcal
Total Fat	7g
Saturated Fat	3g
Trans Fat	Og
Cholesterol	66g
Total Carbohydrates	30g
Dietary Fiber	1g
Sugars	20g
Protein	21g
Calcium	482mg
Magnesium	32mg
Phosphorus	100mg
Potassium	175mg
Sodium	133mg
Iron	1mg
Vitamin A	254IU
Vitamin C	0mg



PREPARATION

OAT WAFER

- Combine brown sugar, rolled oats, whole wheat flour, egg whites, canola oil, modified tapioca starch, baking soda and vanilla extract together in a large food processor.
- 2. Process until all ingredients are incorporated and a ball of dough is formed. Allow dough to rest for a minimum of two hours under refrigeration.

FILLING

- Combine water, sugar, milk, matcha powder and iota carrageenan in a medium-sized sauce pot over heat. Bring to 185°F (85°C) for a minimum of two minutes while using an immersion blender. Reduce heat and keep mixture between 140°F (60°C) and 150°F (66°C) for the remaining processing steps.
- 2. Add yogurt and heavy cream to heated mixture and mix well.

- 3. Remove from refrigeration and roll dough to a thickness of 1/8" on a silicone-lined sheet pan.
- 4. Bake wafer dough at 320°F (160°C) for 20 minutes. Remove from oven and allow to cool.
- 5. Cut cooked wafers into 8.23g portions and reserve for later use.
- 3. Using an immersion blender, slowly disperse milk protein isolate into the mixture. Remove mixture from heat and slowly add egg yolks while continuing to use high-shear mixer.
- 4. Remove mixture from pot and cool rapidly to below 40°F (4°C). Allow to sit overnight.
- 5. Place 1,000g of filling into a front-loading ice cream machine and spin for approximately four minutes per 1,000g batch. Reserve frozen material in a nonreactive container.

COMPLETE BAR

- 1. Place 53.5g of tempered frozen yogurt filling between two pre-baked oat wafers and form into proper bar shape.
- 2. Package as desired.

Rely on the dynamic lineup of U.S. Dairy to meet consumer demands in global product development. The U.S. Dairy Export Council^{*} (USDEC) offers resources on **ThinkUSAdairy.org**, including a dairy ingredient supplier search, consumer, nutrition and product research, technical insights and prototype assistance to help develop and launch your next successful product. () @ThinkUSAdairy in www.linkedin.com/company/ThinkUSAdairy

¹Forecasting the Future of Snacking. Food Business News website. http://www.foodbusinessnews.net/articles/news_home/Consumer_Trends/2017/03/Forecasting_the_ future_of_snac.aspx?ID=%7B37D729D8-89D2-42D7-861E-A8ED66D6DCD7%7D. Updated March 7, 2017. Accessed May 3, 2017.

This formula serves as a reference. Product developers are encouraged to modify the formula to meet manufacturing and finished product specifications needs. Developed at CSSI Culinary, Chicago, IL. Based upon Iowa State University formulation of Beyond the Bar. ©2017 U.S. Dairy Export Council.

