

# FLAVOURED MILK CONSUMPTION AMONG CHILDREN

# A REVIEW OF THE EVIDENCE



## BACKGROUND

### RATIONALE

FM= FLAVOURED MILK

- Worldwide, calcium is a nutrient of concern
- Many children are not meeting their targets<sup>1-3</sup>, especially teenage girls<sup>1,3,4</sup>
- Milk is the most popular type of dairy & largest source of calcium in their diet<sup>5-7</sup>
- Flavouring milk is a recommended strategy to increase consumption<sup>4,6,8-12</sup>
- FM is a nutrient-rich beverage: protein, Ca, Mg, B<sup>2</sup>, phosphorus, K, Zn & vitamin A<sup>13</sup>
- What about added sugars?

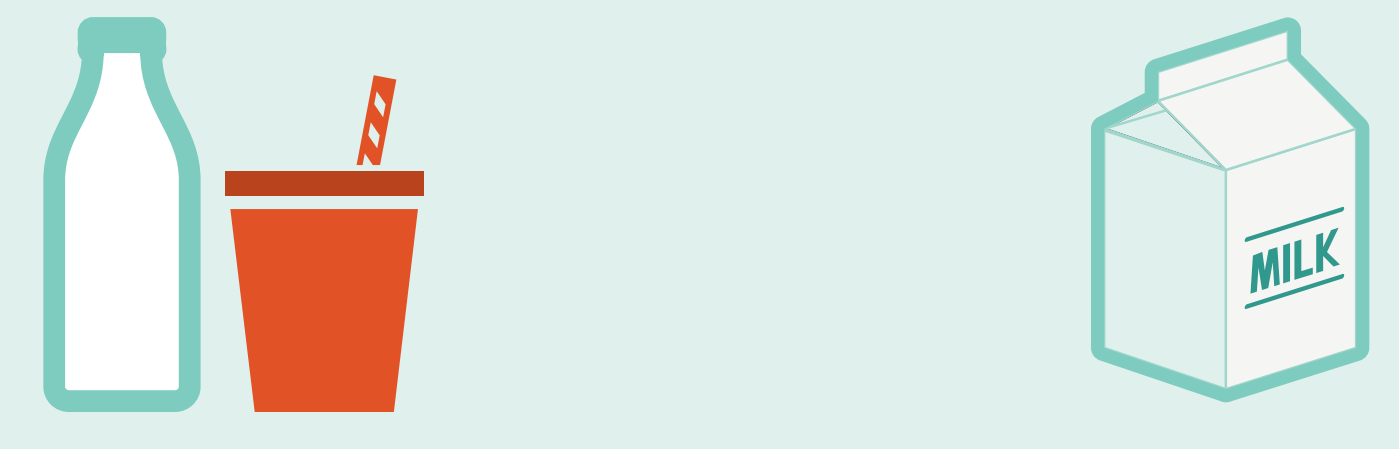
## 2 OPPOSING VIEWS ON FM



- ANTI**
  - Contributes to added sugars
  - Added sugars intake has been linked to many diseases
  - Nutrient density does not outweigh the added sugar
- PRO**
  - Palatable, nutrient dense beverage
  - Helps children meet nutrient targets
  - Benefits outweighs any detriments of added sugar
  - Contribution of added sugar from FM is lower than other beverages (i.e. soft drinks)

Worldwide guidelines generally recommend flavoured milk with caveats on added sugars.

## FM IN THE LITERATURE IS CATEGORISED AS EITHER:



SUGAR-SWEETENED OR BEVERAGES<sup>14-17</sup> OR MILK<sup>4,18-27</sup>

## AIM

- TO SUMMARISE ALL STUDIES RELATED TO FLAVOURED MILK CONSUMPTION, INCLUDING BEHAVIOUR AND PREFERENCES AND;
- TO INTERPRET THE SCIENCE TO UNDERSTAND THE BENEFITS OR DETRIMENTS THAT FLAVOURED MILK MAY HAVE IN CHILDREN'S DIET AND HEALTH

## CONCLUSIONS

- The growing body of evidence shows FM is a popular, palatable and nutrient dense beverage
- Children who drink FM drink more total milk and they are not exclusive drinkers of FM
- When FM is not available children drink less plain milk and hence, less milk overall
- Micronutrient intakes of FM consumers are in line with that of plain milk consumers

## METHODS

**SYSTEMATIC SEARCH OF MedLine & PubMed USING KEYWORDS:**

MILK, FLAVOURED, SWEETENED, and CHOCOLATE, limited to English, and children

**EXCLUSION CRITERIA:**

- Adults
- Sports performance
- Technical studies
- Did not report on flavoured milk outcomes

**1976 ABSTRACTS IDENTIFIED:**

- 186 full text assessed
- 51 studies included

**RESULTS ARE PRESENTED ON:**

- Prevalence of consumption
- Preferences & behaviour
- Total milk intake & nutrient contribution
- FM & anthropometric measures
- FM & dental health

## RESULTS

### 1. PREVALENCE OF CONSUMPTION

- TRENDS:** limited data, likely increasing<sup>5</sup>
- PREVALENCE**
  - Varies widely & not reported in the same way
  - % consumers varies from 1% in some age groups (2-5y) in the US<sup>5</sup> and up to 59% among Australian adolescents<sup>32</sup>
- IN THE U.S. FM CONSUMED PREDOMINANTLY AT SCHOOL AND AT LUNCH**
  - 46.9% of children consume flavoured milk at school vs. 8.7% at home<sup>41</sup>
  - 22% and 50% of children participating in school lunch programs have FM at breakfast and at lunch, respectively<sup>40</sup>
- ASSOCIATION WITH AGE IS INCONSISTENT:**
  - studies report consumption increases<sup>5,8,10,46</sup> and others report it decreases<sup>11,40,44</sup> with age
- FM CONSUMERS ALSO CONSUME PLAIN MILK**<sup>8,11,43,44</sup>

### 2. PREFERENCES & BEHAVIOUR

31 million children participate in the U.S. National School Lunch Program<sup>47</sup>

>90% SCHOOLS OFFER FM<sup>12,40,48</sup> >60% OF MILK SOLD<sup>29,49</sup> = POPULAR CHOICE<sup>50</sup>

### CHILDREN CHOOSE CHOCOLATE OVER PLAIN MILK AND CONSUME MORE TOTAL MILK<sup>5</sup>

KIDS CHOOSE

CHOC X4<sup>50</sup> vs PLAIN

Plain milk intake doesn't increase if FM is not available<sup>51-53</sup>

+27.6% MILK CONSUMPTION<sup>9</sup> vs -37% MILK INTAKE<sup>53</sup>

### 4 ADDITIONAL SCHOOL FOODS

+++ extra kilojoules, ++ \$\$\$ would be needed to replace nutrients lost from reduced milk intake when flavoured milk is not available<sup>53</sup>

## RESULTS CONTINUED

### 2. PREFERENCES & BEHAVIOUR CONTINUED

- PALATABILITY**
  - FM is the most palatable milk<sup>45</sup> regardless of milk type or fat content<sup>45,54-56</sup>
  - Children are as likely to consume lower sugar and lower fat FM as standard FM
  - Taste is the main driver of consumption among children<sup>57</sup>
  - Increase FM convenience = increase intake<sup>58</sup>
  - Decrease FM convenience = no effect on sales<sup>2</sup>

ONLY 20% OF CHILDREN PREFER PLAIN MILK OR FRUIT FLAVOURED OVER CHOCOLATE<sup>57</sup>

### 3. TOTAL MILK INTAKE & NUTRIENT CONTRIBUTION FOR FM CONSUMERS

- HIGHER TOTAL MILK, SIMILAR MICRONUTRIENT INTAKE VS PLAIN MILK CONSUMERS**
- GREATER LIKELIHOOD OF MEETING CALCIUM TARGETS VS PLAIN MILK CONSUMERS**
- SOME SUBGROUPS REPORT HIGHER ENERGY CONTRIBUTION, OTHERS REPORT NO DIFFERENCE OR LOWER THAN PLAIN MILK**
- PLAIN OR FM PROVIDE A GREATER PERCENTAGE OF DAILY NUTRIENTS (Ca, vit A, vit D, Mg, P, K) THAN THEY PROVIDE CALORIES<sup>58</sup>**
- INCONSISTENT DIFFERENCES IN SUGAR INTAKE (and type of sugar measured) were reported. Similar, higher and lower intake of total, added and intrinsic sugar were reported between FM consumers and non-consumers. DIFFERENCE RANGED BETWEEN 0.5 TO 1.5 TSP/DAY** 9, 11, 38,43

### 4. HEALTH OUTCOMES: ANTHROPOMETRIC

- NO DIFFERENCES WERE REPORTED BETWEEN FM CONSUMERS AND NON-CONSUMERS FOR BMI<sup>11,43,59</sup>, BMIZ SCORE<sup>11</sup>, WAIST CIRCUMFERENCE<sup>43</sup>, CROSS-SECTIONAL PREVALENCE OF OVERWEIGHT AND OBESITY<sup>43,44</sup> AND PERCENT BODY FAT<sup>44</sup>**
  - FM not associated with greater BMI, prevalence of overweight and prospective change in BMI among normal weight children
- AMONG OVERWEIGHT CHILDREN, CONFLICTING RESULTS WERE REPORTED:**
  - No differences in flavoured milk consumption and 5-year change in BMI<sup>59</sup>
  - Positive association between FM consumption and anthropometric measures among overweight children<sup>44</sup>
- REPLACEMENT OF SOFT DRINK WITH FM = REDUCED ENERGY INTAKE AMONG OVERWEIGHT CHILDREN<sup>60</sup>**
- ASSESSMENT OF OVERWEIGHT PREVALENCE AMONG FM CONSUMERS PARTICIPATING IN THE US NATIONAL BREAKFAST AND LUNCH PROGRAMS SHOWED:**
  - BMI was positively related to the percent energy from FM<sup>62</sup>
  - All other studies found no association with FM & obesity<sup>41,42,61</sup>

### 5. HEALTH OUTCOMES: DENTAL

- MAJORITY OF STUDIES REPORT NO ASSOCIATION BETWEEN FM INTAKE AND DENTAL CARIES<sup>39,63-65</sup>**
  - Both sugar and chocolate milk reported highest potential cariogenicity due to low pH<sup>65</sup>

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