Children consuming milk cereal drink are at increased risk for overweight- the IDEFICS Sweden study

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BACKGROUND

Although Swedish guidelines recommend that exclusive breastfeeding should continue for six months, the majority of Swedish children are introduced to other foods before six months of age.

During the period in which complementary foods are introduced life-long eating habits may be established. A common complementary food offered mainly in Sweden is "välling", a milk cereal drink (MCD) that has been consumed for hundreds of years and sold as a ready-made mix since the 1940's.

The Swedish National Food Administration recommends iron fortified MCD or porridge be served on a daily basis from the age of six months to ensure a sufficient iron intake. MCD has previously been investigated in relation to gluten intolerance; however, little is known about MCD consumption and childhood overweight.

To our knowledge, only one previous study has investigated MCD consumption in overweight, reporting that infants' consumption of MCD at six months of age increased the risk of a high body mass index (BMI) at 12 and 18 months.

AIM

The aims of the present study were to characterize milk cereal drink (MCD) consumers and to investigate whether the association between MCD and overweight persists beyond the age of 18 months in a cohort of Swedish children followed longitudinally.

SUBJECTS

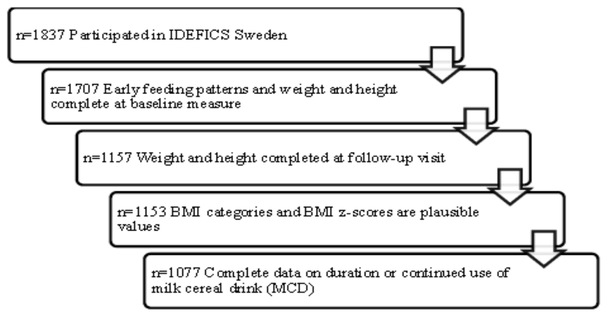
Identification and prevention of Dietary- and lifestyle-induced health EFfects In Children and infantS (IDEFICS) is a multi-centre study in eight countries examining risks for overweight/obesity in over 16,000 children.

The present study is based on the Swedish IDEFICS cohort (n=1837) and our final sample includes 1077 children for whom early feeding practices were described at baseline and weight and height were recorded for both baseline and two year follow-up (see Figure 1).

The children were 2-9 years old at the 2007-2008 baseline and 4-11 years old at follow-up. Detailed information on the 8 country IDEFICS study design has been described (Ahrens W, 2011).

All materials for the Swedish study were initially prepared in English, translated to Swedish and then back translated to English for quality control prior to data collection. Each country obtained ethics approval.

Figure 1: Study participants



RESULTS

MCD was consumed by the majority (68.7%) of Swedish children, especially those born to native Swedish parents.

The widespread consumption of MCD was an expected finding given that it is recommended as an early complementary food by the Swedish National Food Administration .

Parents with less than two years post-secondary education were more likely to offer MCD.

MCD consumption was associated with an increased mean BMI-z-score over two years and overweight at follow-up.

Figure 2 Mean BMI z-score by MCD consumption (yes / no) and examination (baseline, follow-up). Cross-sectional comparisons by MCD consumption and longitudinal comparisons within consumers vs. non-consumers are shown with adjustment for age, sex of the child, birth weight, mother's BMI, parental education, and breast feeding.

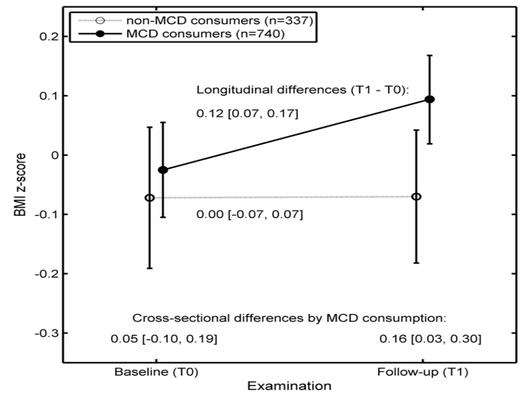


Table 1: Association between milk cereal drink (MCD) consumption and overweight (including obesity) at follow-up: MCD consumption subsequently parameterized as ever vs. never, by duration, and by time of introduction.

	Model 1		Model 2	
	OR	95 % CI	OR	95 % CI
All children (total n=1077, n=106 overweight)				
Consumption of MCD				
Ever vs. never	1.79*	1.13-2.81	1.70*	1.06-2.71
Duration of consumption				
≤12 months duration vs. never	1.85*	1.06-3.22	1.59	0.89-2.84
≥13 months duration vs. never	1.76*	1.09-2.83	1.64*	1.00-2.67
Time of introduction				
At 6 months vs. never	1.67*	1.05-2.68	1.62	1.00-2.63
≤ 5 months vs. never	2.23**	1.23-4.04	1.63	0.87-3.07
Children without overweight at baseline (total n=971, n=46 overweight)				
Consumption of MCD				
Ever vs. never	5.12**	1.82-14.45	4.78**	1.68-13.59
Duration of consumption				
≤12 months duration vs. never	4.35*	1.36-13.88	3.53*	1.08-14.2
≥13 months duration vs. never	5.47**	1.91-15.69	4.90**	1.69-14.16
Time of introduction				
At 6 months vs. never	5.06**	1.77-14.44	4.71**	1.64-13.58
≤ 5 months vs. never	5.39**	1.62-17.88	3.66*	1.06-12.66

*p<0.05, **p<0.01, ***p<0.001
Model 1: Adjusted for age class and sex.
Model 2: Adjusted for age class, sex, birth weight, education, any breastfeeding and mother's BMI.
OR= odds ratio, CI= confidence interval

DISCUSSION OF POTENTIAL MECHANISMS BY WHICH MCD COULD CONTRIBUTE TO OVERWEIGHT

First, MCD consumption could contribute to eating for comfort rather than hunger. MCD is marketed as an appropriate food before bedtime since "satiated children sleep well".

Second, MCD is traditionally fed to children from a bottle and the fact that MCD packaging provides instructions for 'directly in the bottle' preparation suggests that this is still commonly the case. A recent study shows that adults who were bottle-fed in infancy had less healthy eating behaviours later in life than those who were breastfed (Robinson S, 2013).

Third, introduction of MCD is at odds with exclusive breastfeeding. We examined any breastfeeding, (i.e. breastfeeding in combination with complementary foods) for an extended period of time and found that MCD consumption shortened exposure to any breast milk.

CONCLUSIONS

Our with less exposure to breast milk. As we found the majority of Swedish parents offer MCD, our findings motivate future research aimed at investigating how MCD should be recommended.

References:
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Robinson S, Ntani G, Simmonds S, Syddall H, Dennison E, Sayer AA, et al. Type of milk feeding in infancy and health behaviours in adult life: findings from the Hertfordshire Cohort Study. The British journal of nutrition. 2013;109(6):1114-22.

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