



What are our toddlers eating, who is feeding them and where?

Dr Alison Lennox

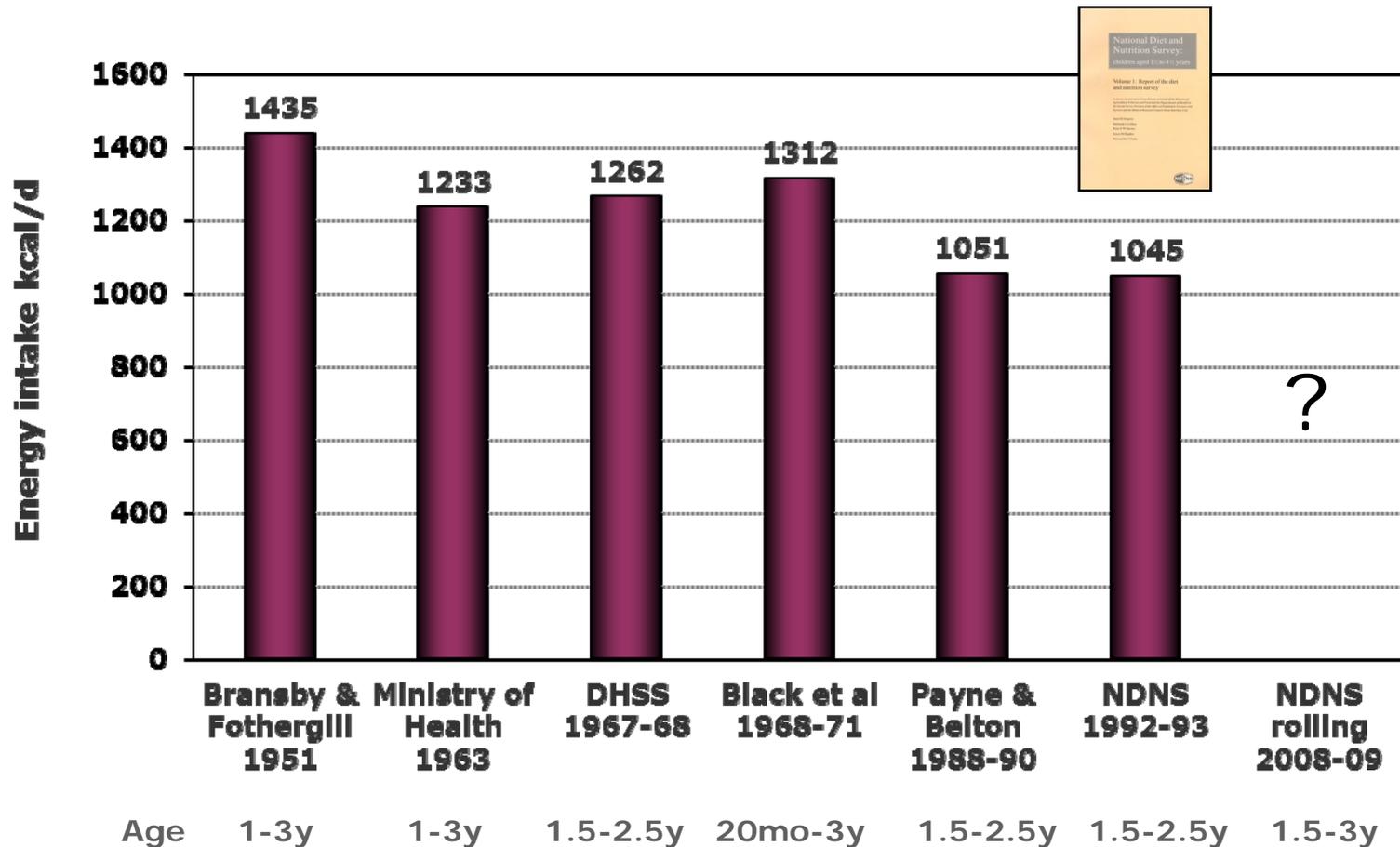
MRC Human Nutrition Research, Cambridge, UK

Infant and Toddler Forum 2009

Are the energy and nutrient intakes of toddlers changing in the UK?



Energy intakes of toddlers – 1951-93

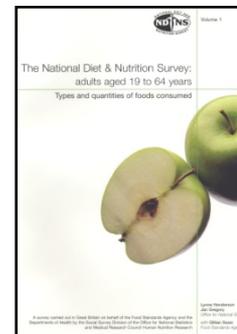
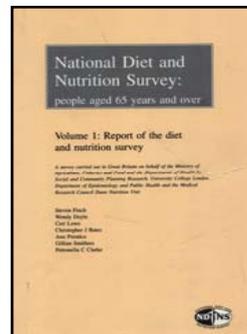
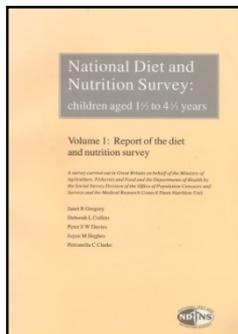
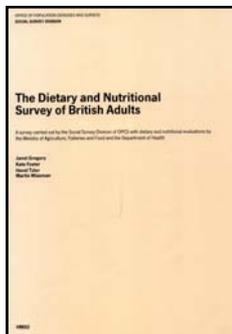


History of NDNS:

- Dietary and Nutritional Survey of British Adults 1986-87

NDNS programme:

- Children aged 1.5 - 4.5 y - fieldwork 1992-3
- People aged 65 + y - fieldwork 1994-5
- Young people aged 4-18 years - fieldwork 1997
- Adults aged 19-64 years - fieldwork 2000-1
- Low Income Diet and Nutrition Survey 4+ years 2003-05



NDNS rolling programme

- Following review of dietary survey programme, FSA Board agreed a rolling programme model for future NDNS.
- Survey will run continuously with fieldwork carried out every year
 - Generate data more rapidly
 - Track changes over time more easily
 - Collect additional data at short notice
 - More responsive to policy needs
- 1000 people per year, all ages 1½ years upwards
- Private households representative of UK
- England, Scotland, Wales, Northern Ireland
- 1000 per year enables trend data every 2-3 years

Sampling in NDNS



Postcode Address File (PAF)
Post Office
small users < 25 items of mail per day



120 Primary Sampling Units (PSUs)
randomly selected



3240 addresses, 27 each PSU, randomly selected
If >1 household at address, 1 chosen at random



27 addresses per PSU



9 addresses:
1 adult, 1 child
If >1 adult or child, chosen at random

18 addresses:
1 child
"child boost"



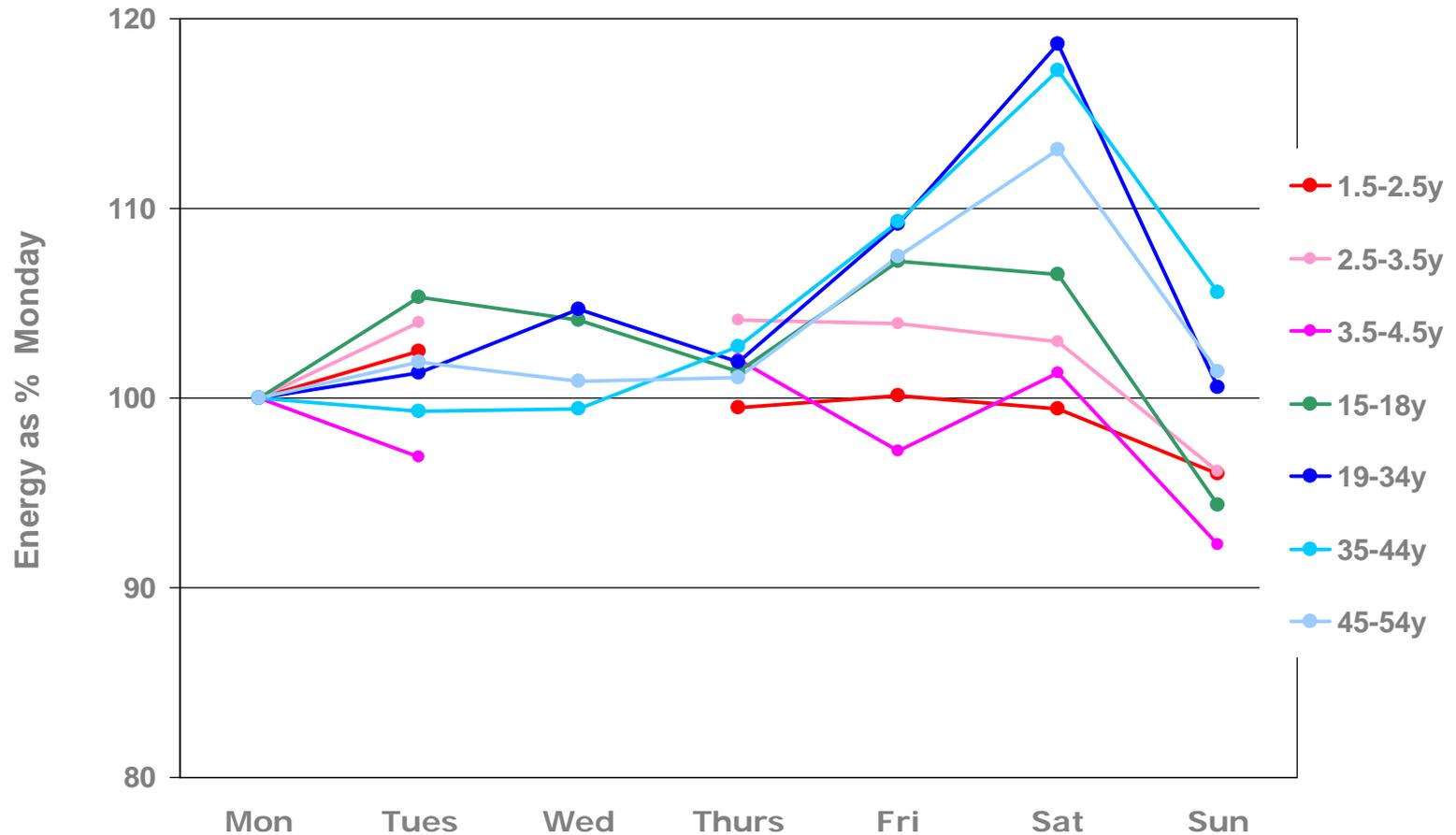
Coding diet diaries



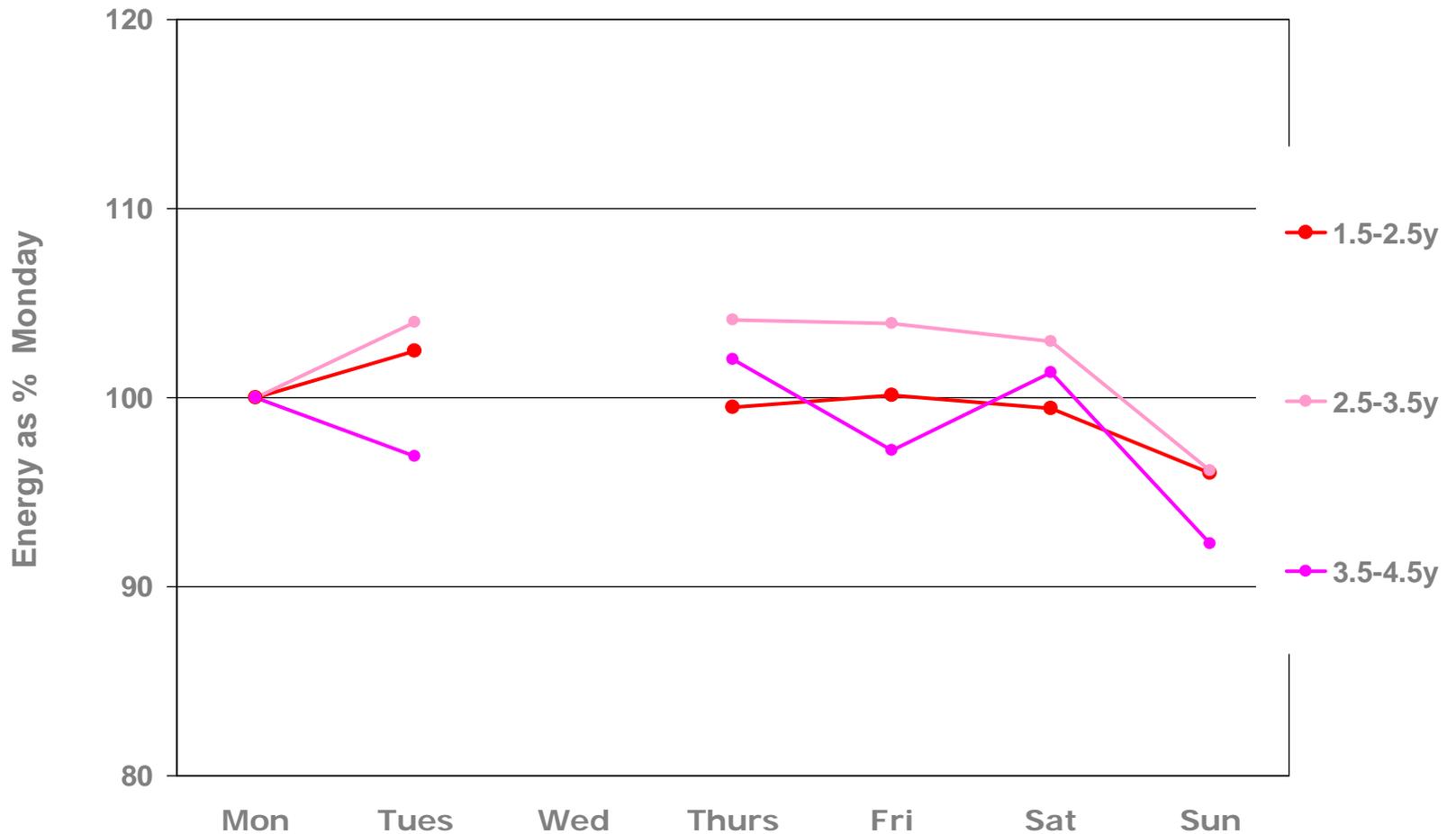
Comparing new NDNS data with previous surveys

- Small sample sizes until 4 years complete
 - Limited number of age subdivisions
- 4 day diary for Y1 included 2 weekend days
 - Y2 adjusted so that by end of Y2, will have random start days for Y1 and Y2 together

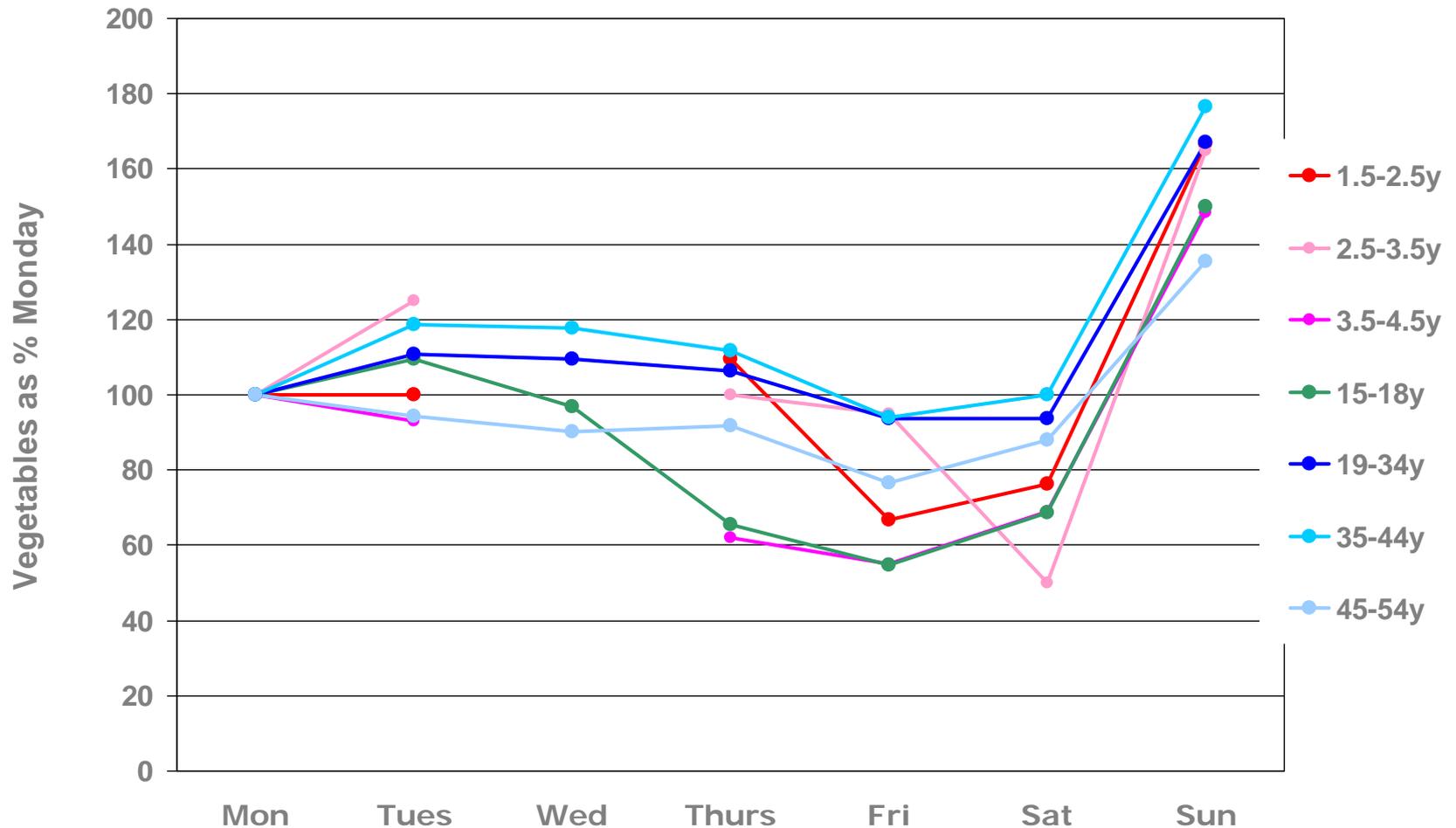
Energy intake by day of week as % Monday intake in NDNS



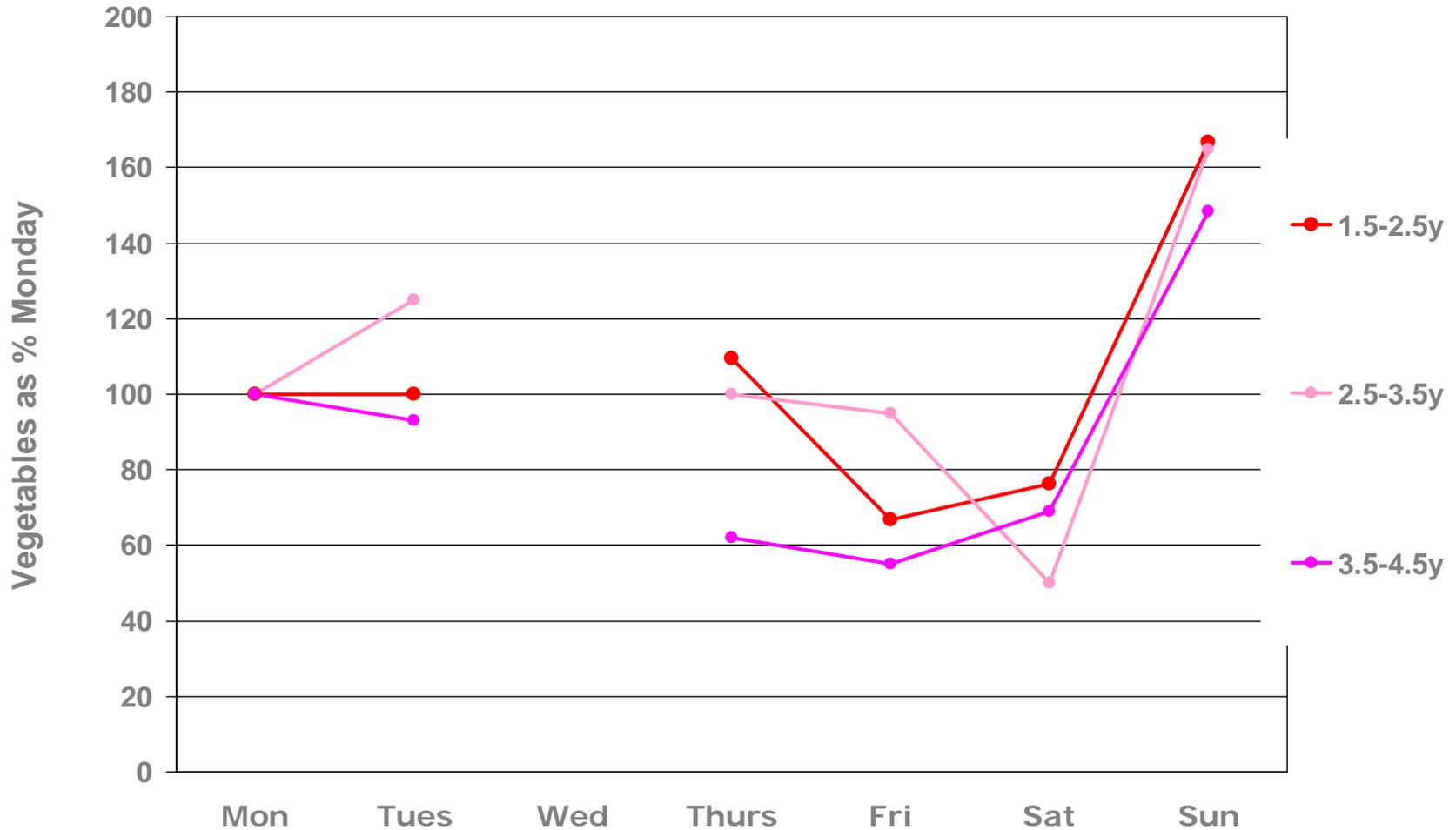
Energy intake by day of week as % Monday intake in NDNS



Vegetable intake by day of week as % Monday intake in NDNS



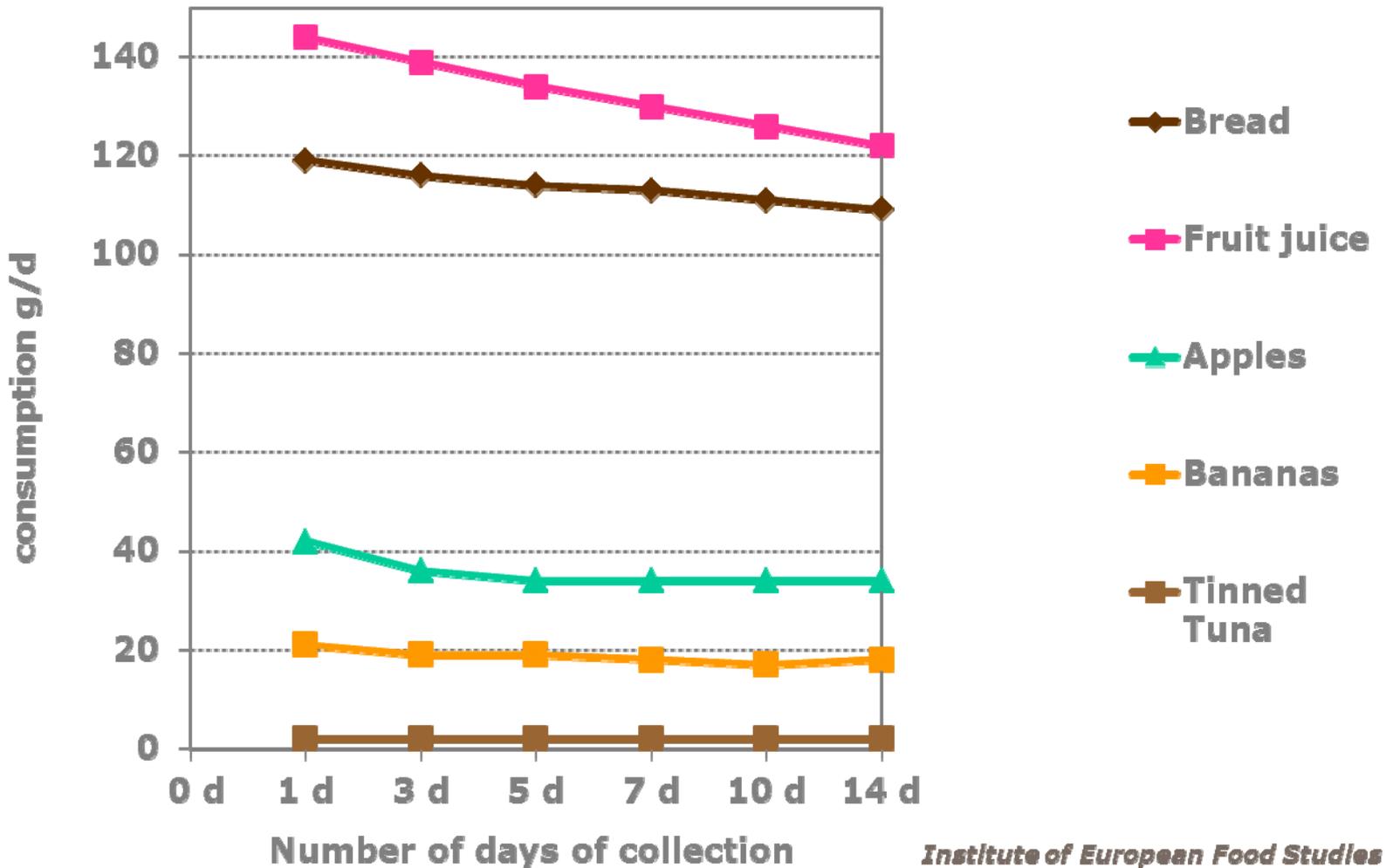
Vegetable intake by day of week as % Monday intake in NDNS



Comparing new NDNS data with previous survey

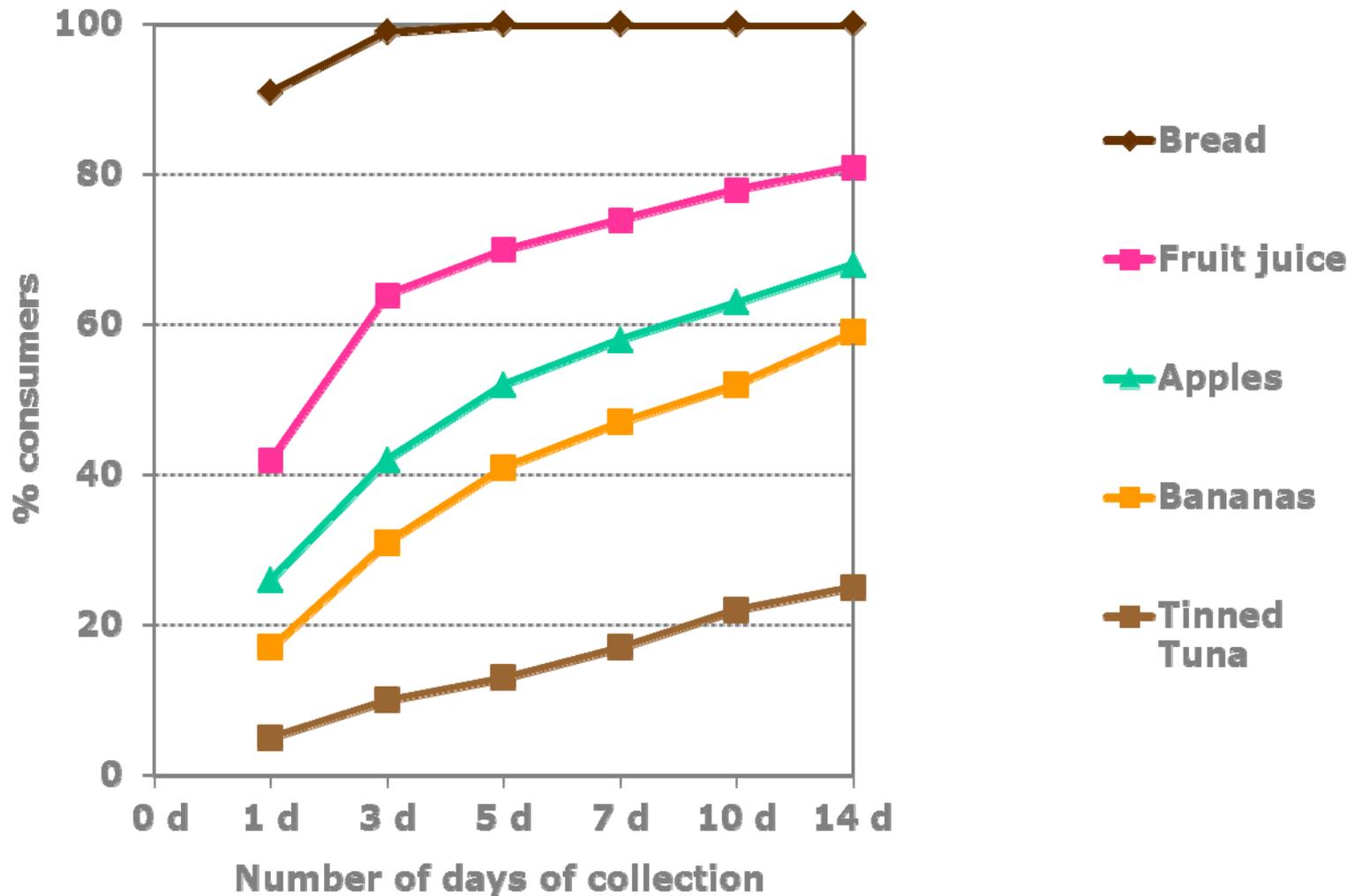
- **Small sample sizes until 4 years complete**
 - **Limited number of age subdivisions**
- **4 day diary for Y1 included 2 weekend days**
 - **Y2 adjusted so that by end of Y2, Y1 and will have random start days**
- **4 day records instead of 7 days**
 - **7 day survey data remodelled for 4 days to allow comparisons**
 - **NDNS 1.5-4.5 y (1992/93) 4 day record corrected to 7d for report. Not converted back to 4 days for Y1 data – but % consumers in report are for 4 days only – hence comparable**

Mean intakes for all participants with increasing days of dietary data collection



Institute of European Food Studies

% consumers with increasing days of dietary data collection



Comparing new NDNS data with previous survey

- Small sample sizes until 4 years complete
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- **Interpretation of results should take these factors into account and be interpreted with caution**

A survey carried out on behalf of the
Food Standards Agency and the
Department of Health



National Diet and Nutrition Survey

Headline results from Year 1 of the Rolling Programme (2008/2009)

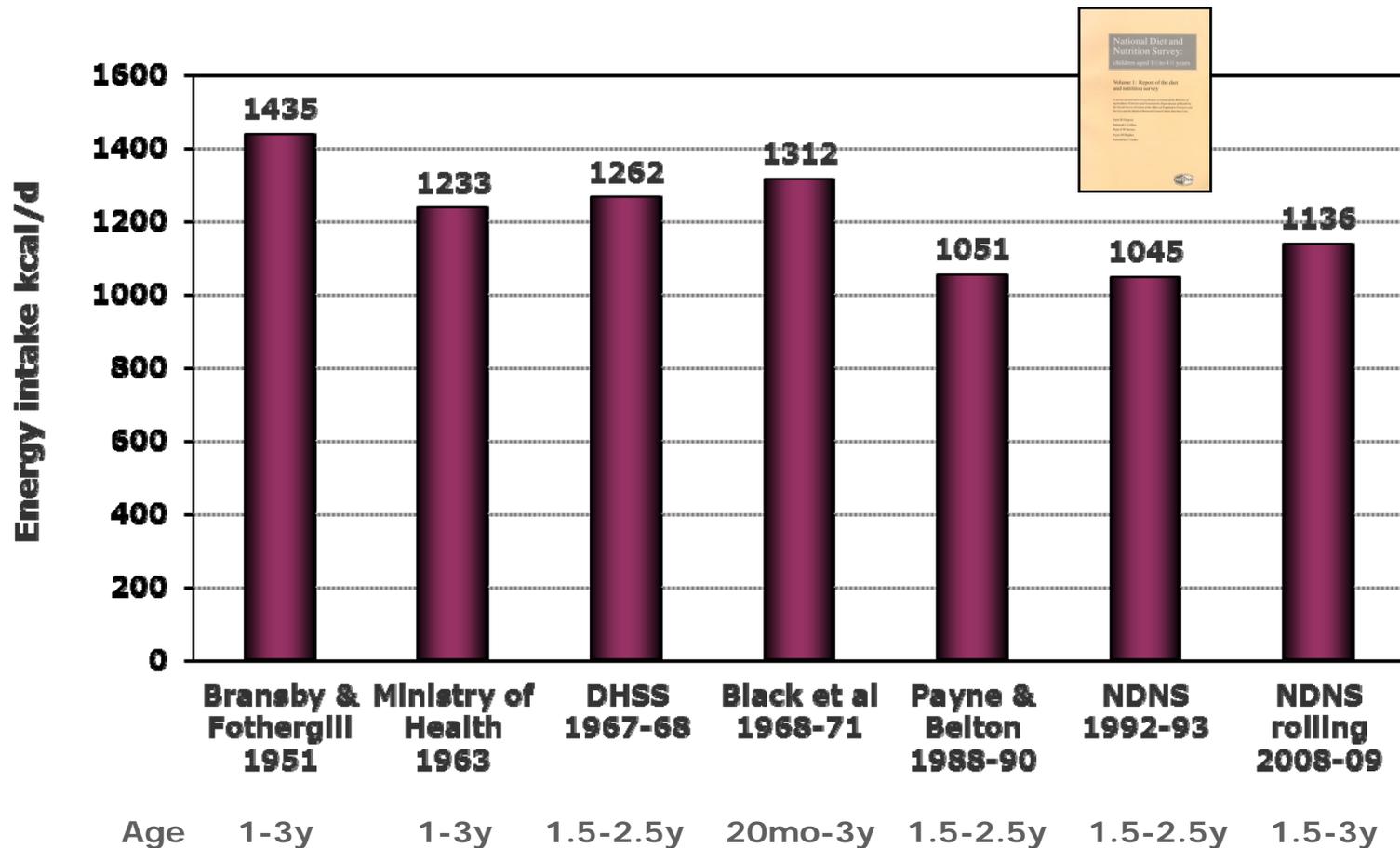
Edited by: Beverley Bates, Alison Lennox, Gillian Swan



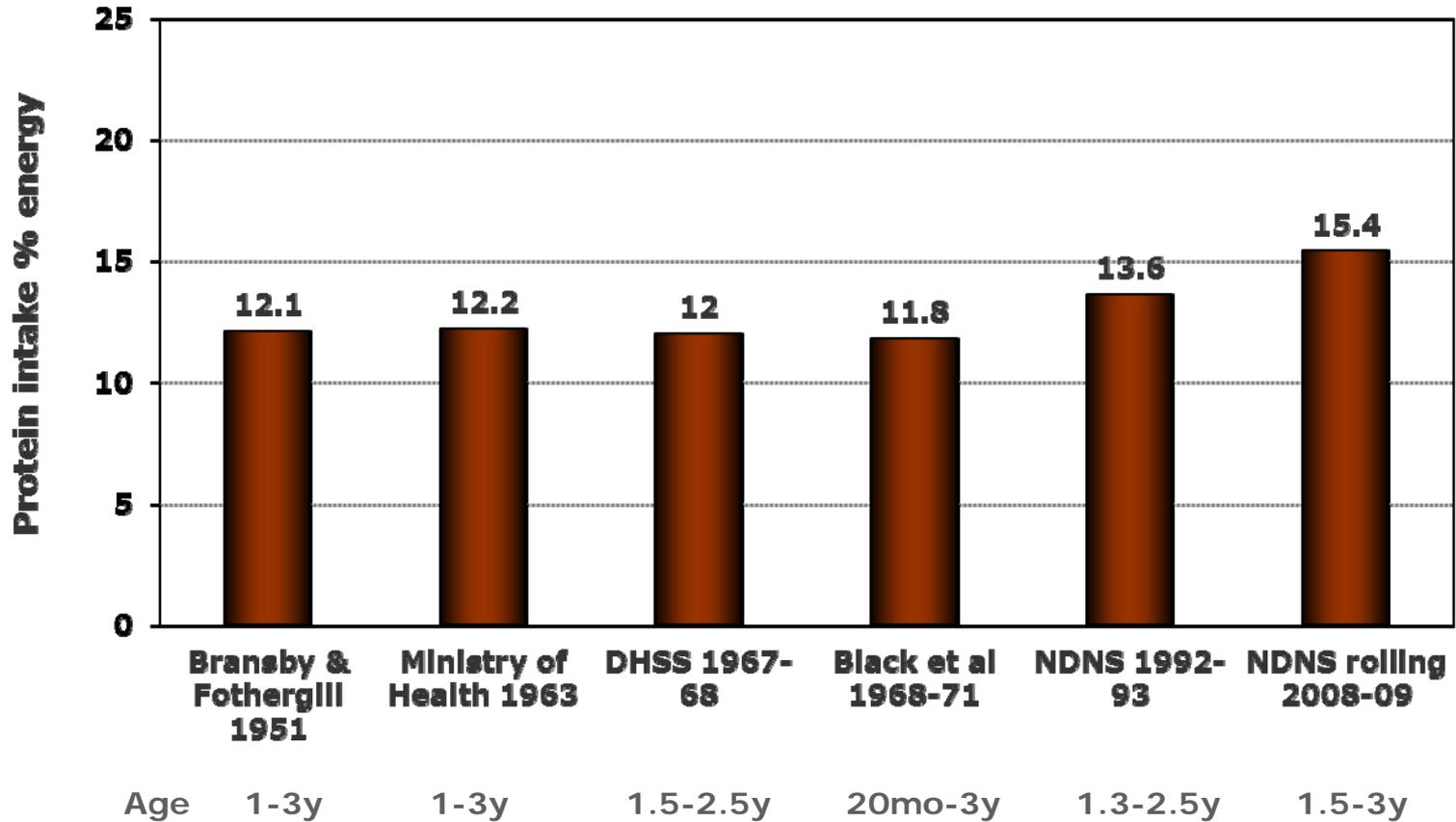
What is in the Year 1 report

- **Food consumption**
 - Consumption of foods and food groups for ages 1.5-3y, 4-10y, 11-18y, 19-64y
 - Comparisons with previous NDNS surveys
 - Estimates of fruit, vegetables, meat and fish consumption, including mixed dishes
 - Assessment of fruit and vegetable portions compared with 5-a-day recommendation – not toddlers or young children
- **Nutrient Intakes**
 - Intakes of macronutrients, and selected minerals and vitamins for ages 1.5-3y, 4-40y, 11-18y, 19-64y
 - Comparisons with government recommendations
 - Comparisons with previous surveys
 - Contributions of major food groups to intakes of macronutrients
- **Height , weight, BMI , supplement use**

Energy intakes of toddlers – 1951-2008



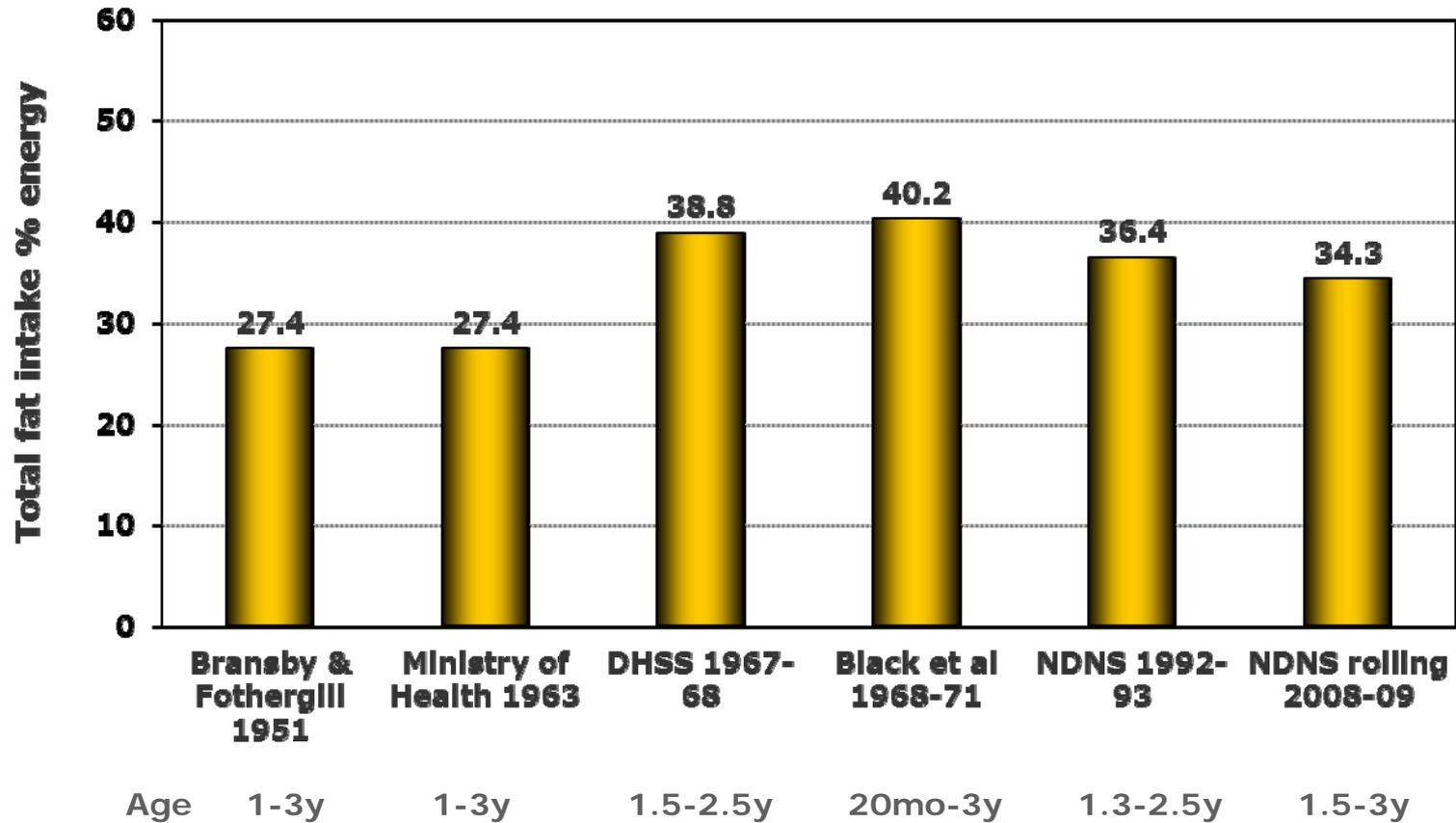
Protein intakes of toddlers – 1951-2008



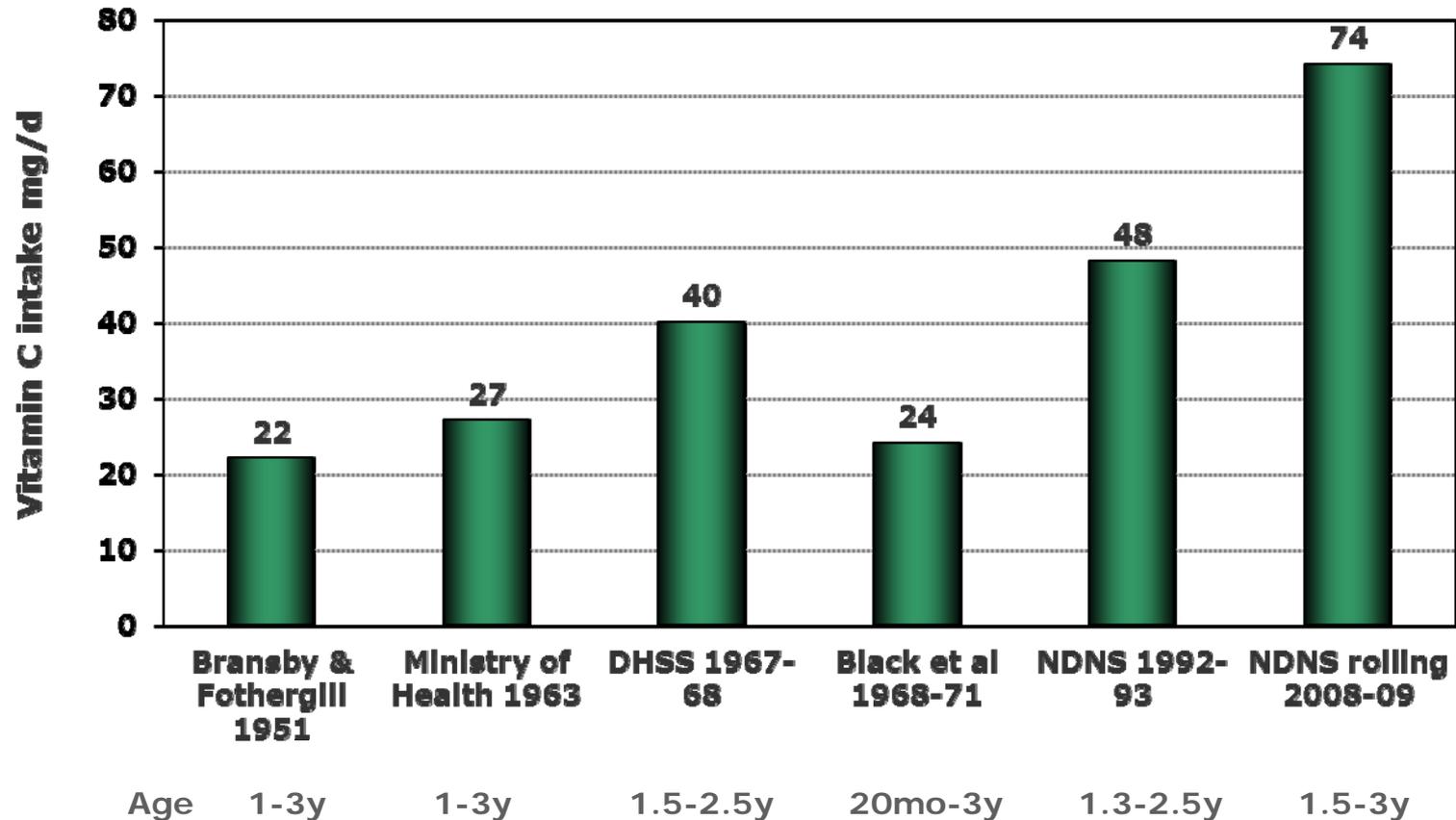


Grab your
voting
pads...

Total fat intakes of toddlers – 1951-2008



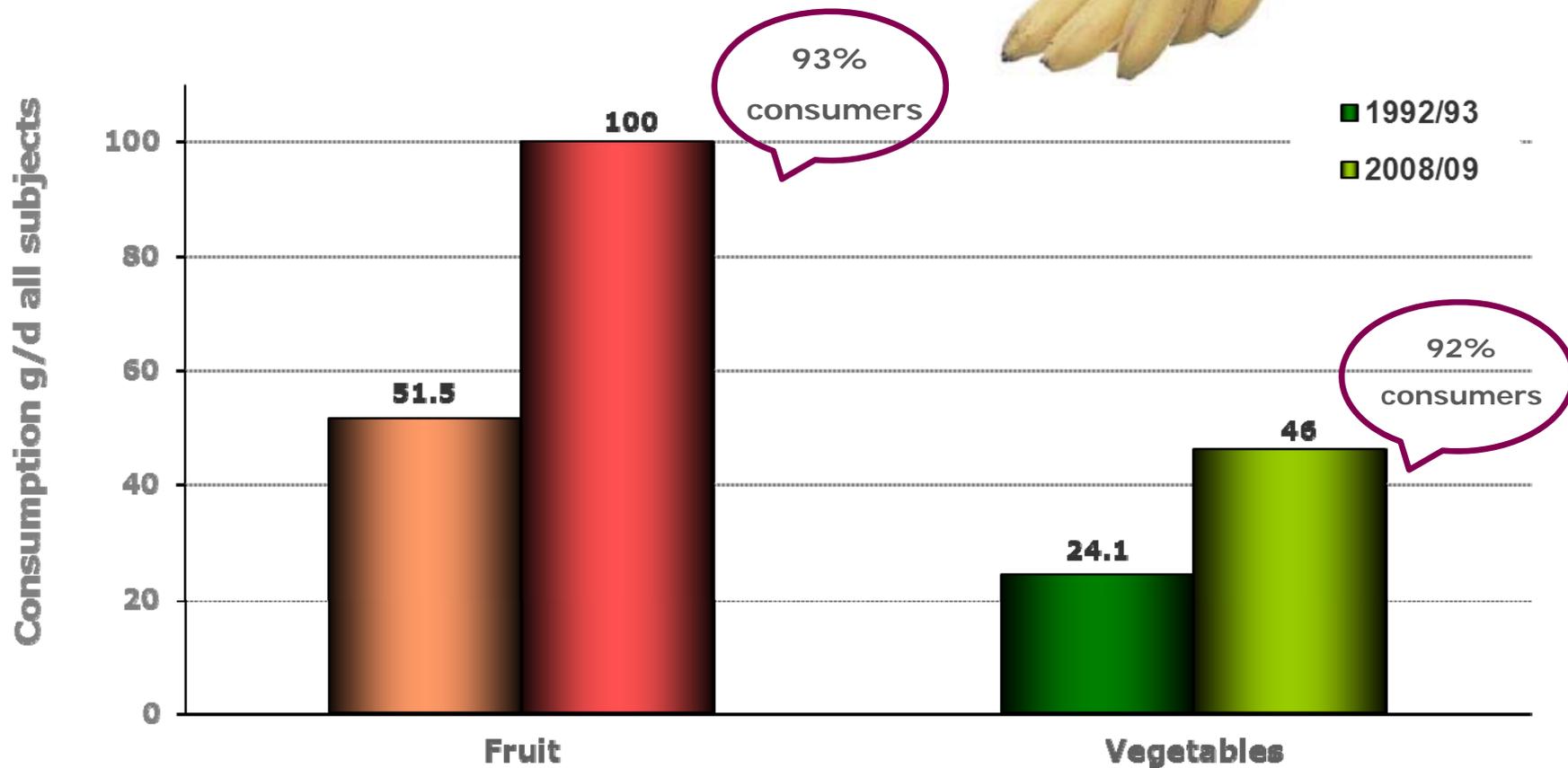
Vitamin C intakes of toddlers – 1951-2008



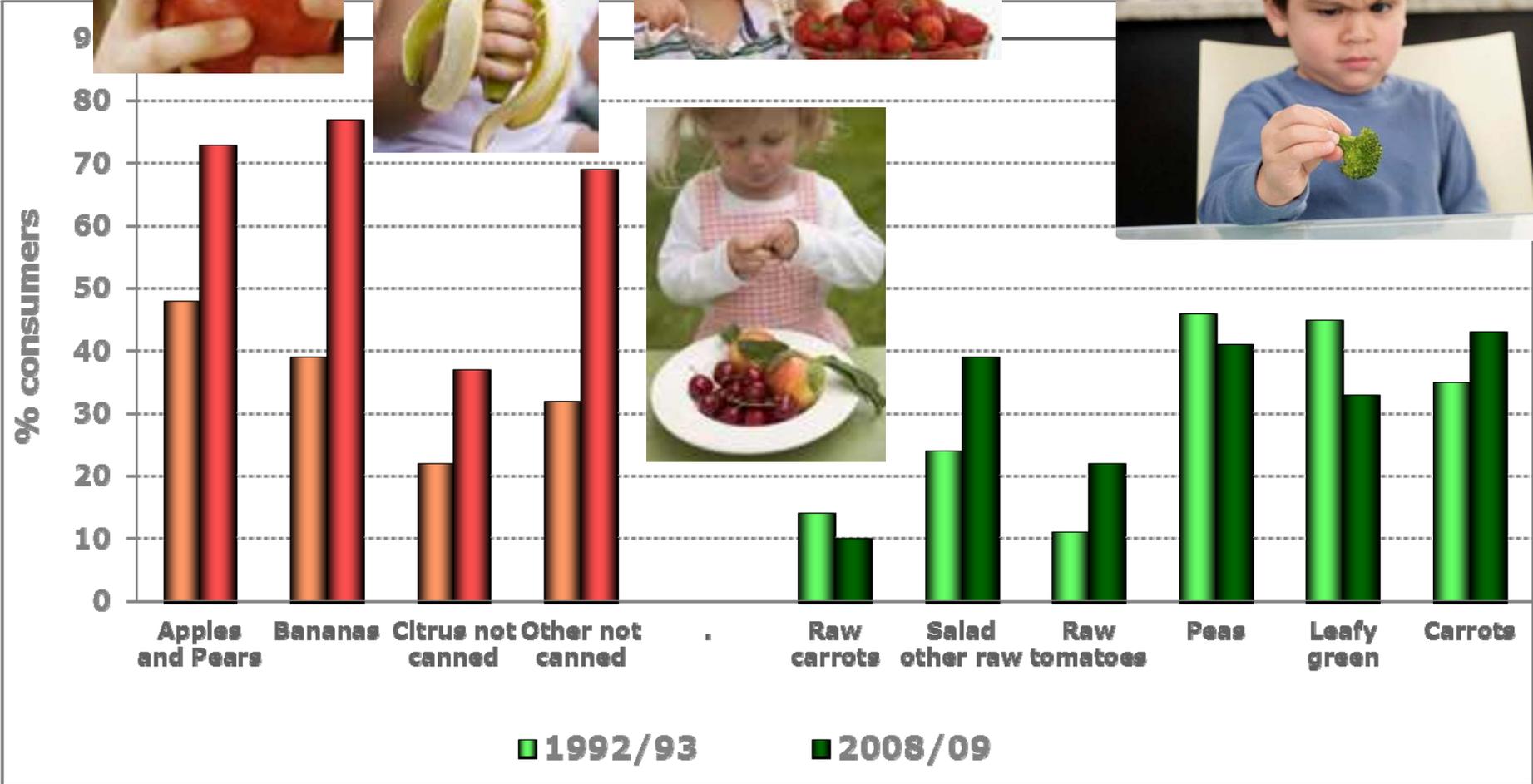


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Fruit and vegetables in toddlers 2008/09 vs 1992/93



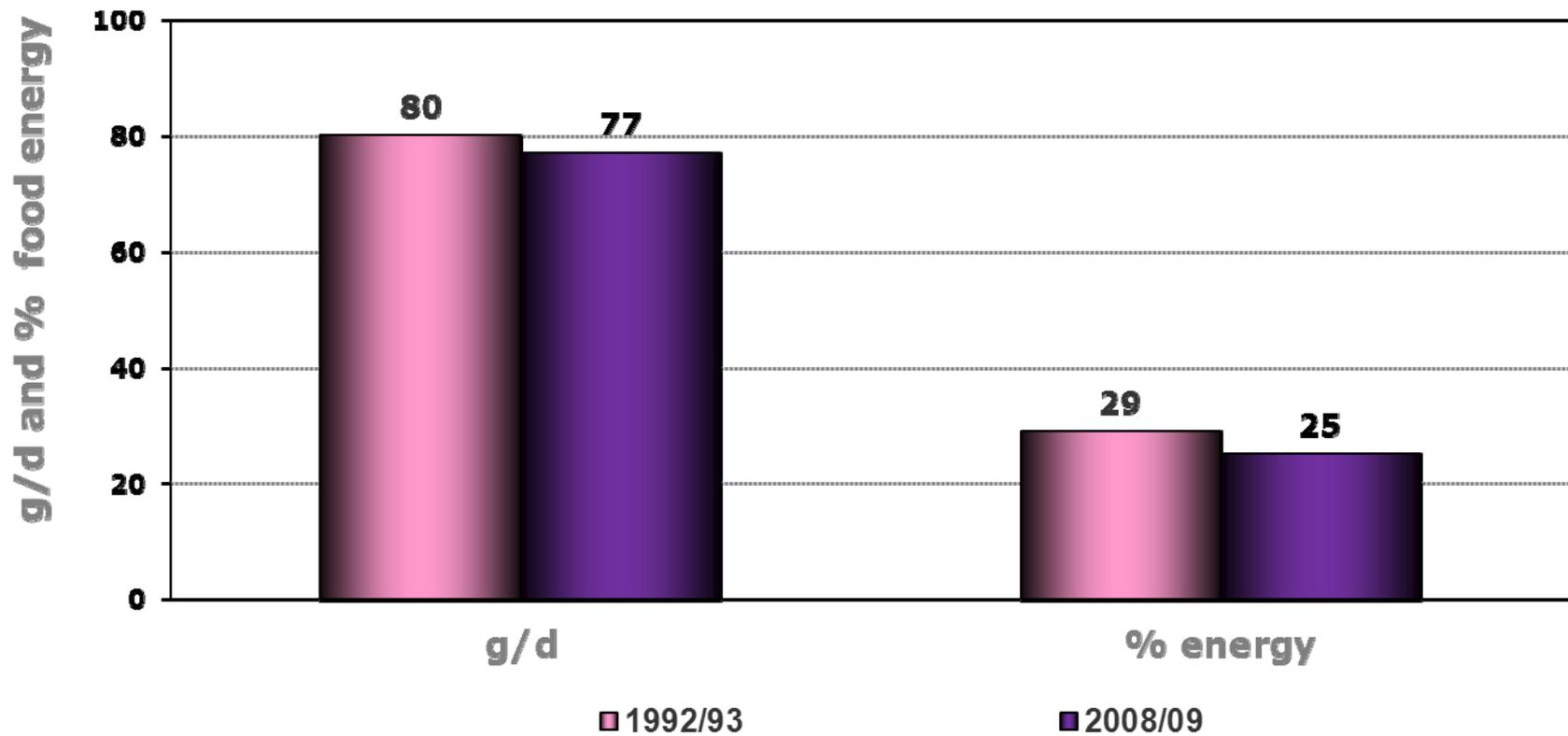
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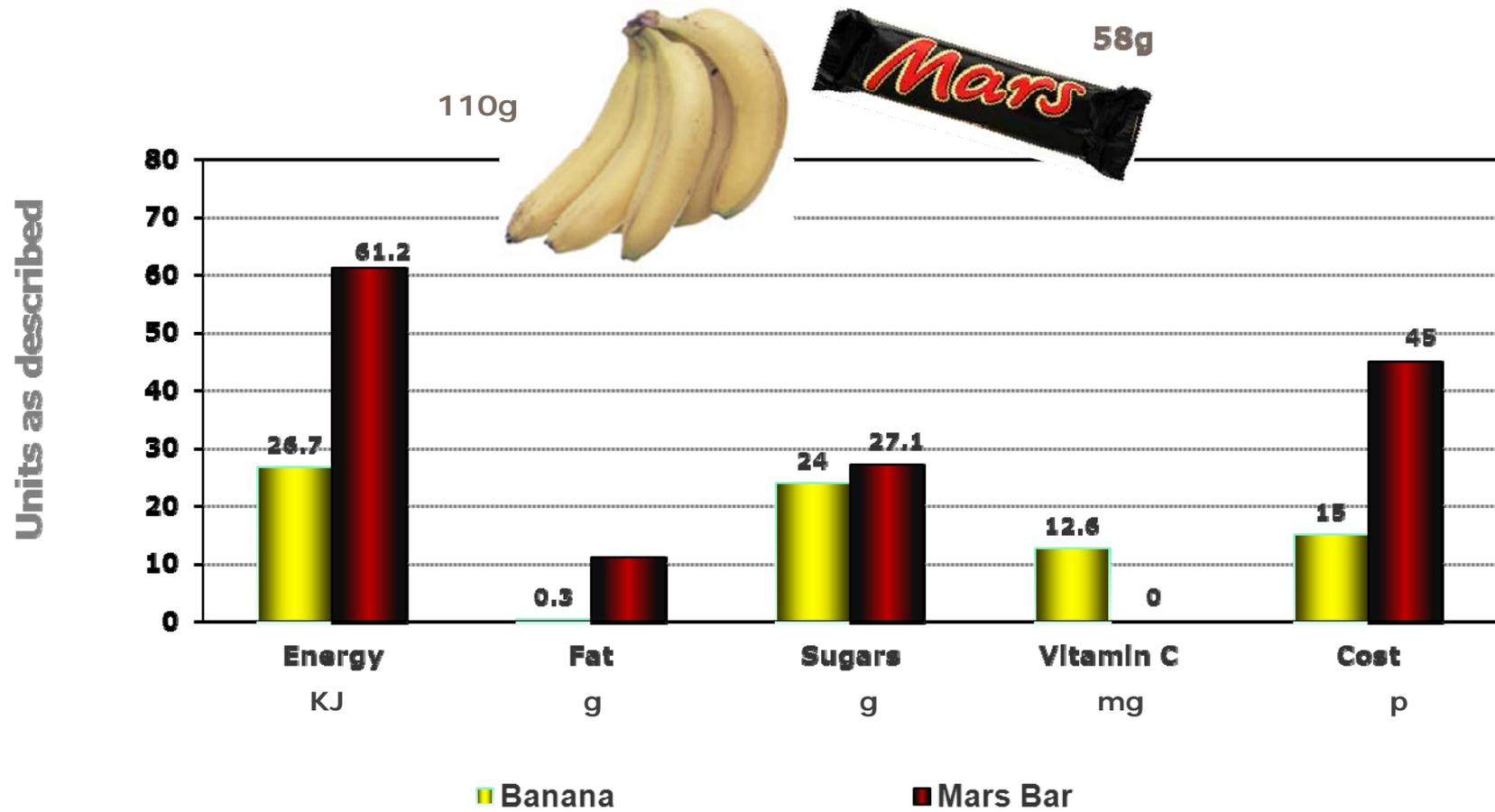


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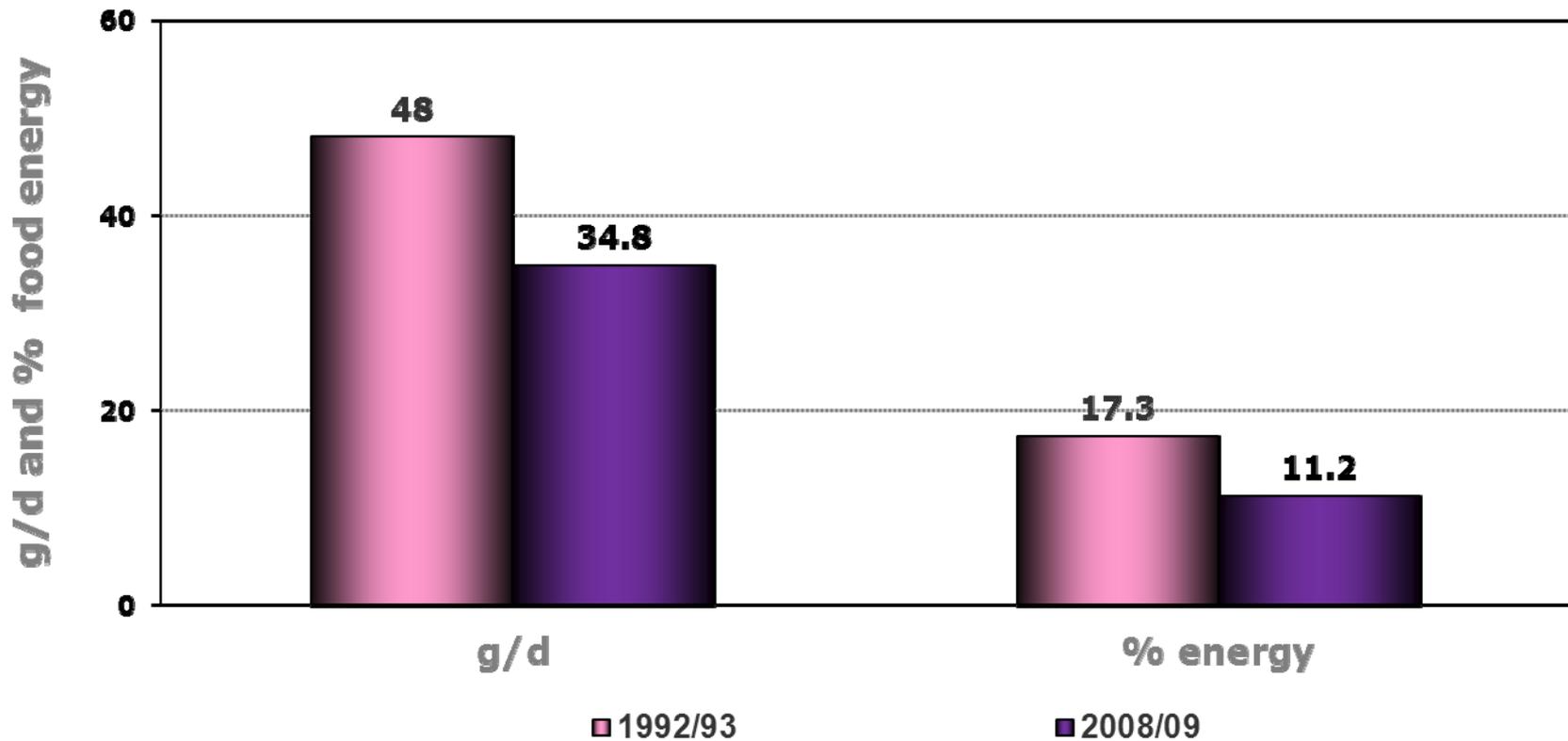
Total sugars intake in toddlers – 1992/93 vs 2008/09



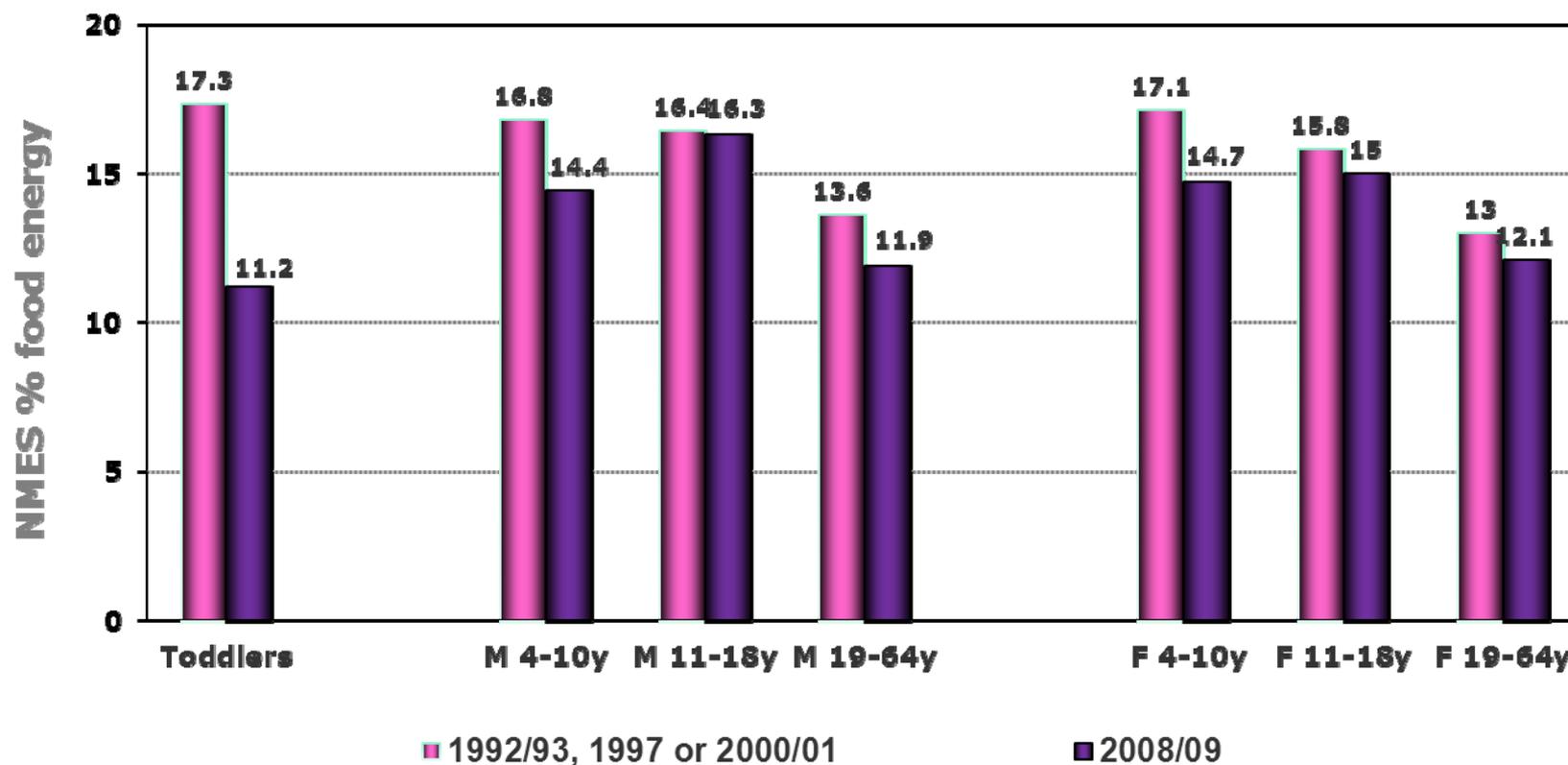
Banana vs Mars bar



NMES intake in toddlers – 2008/09 vs 1992/93

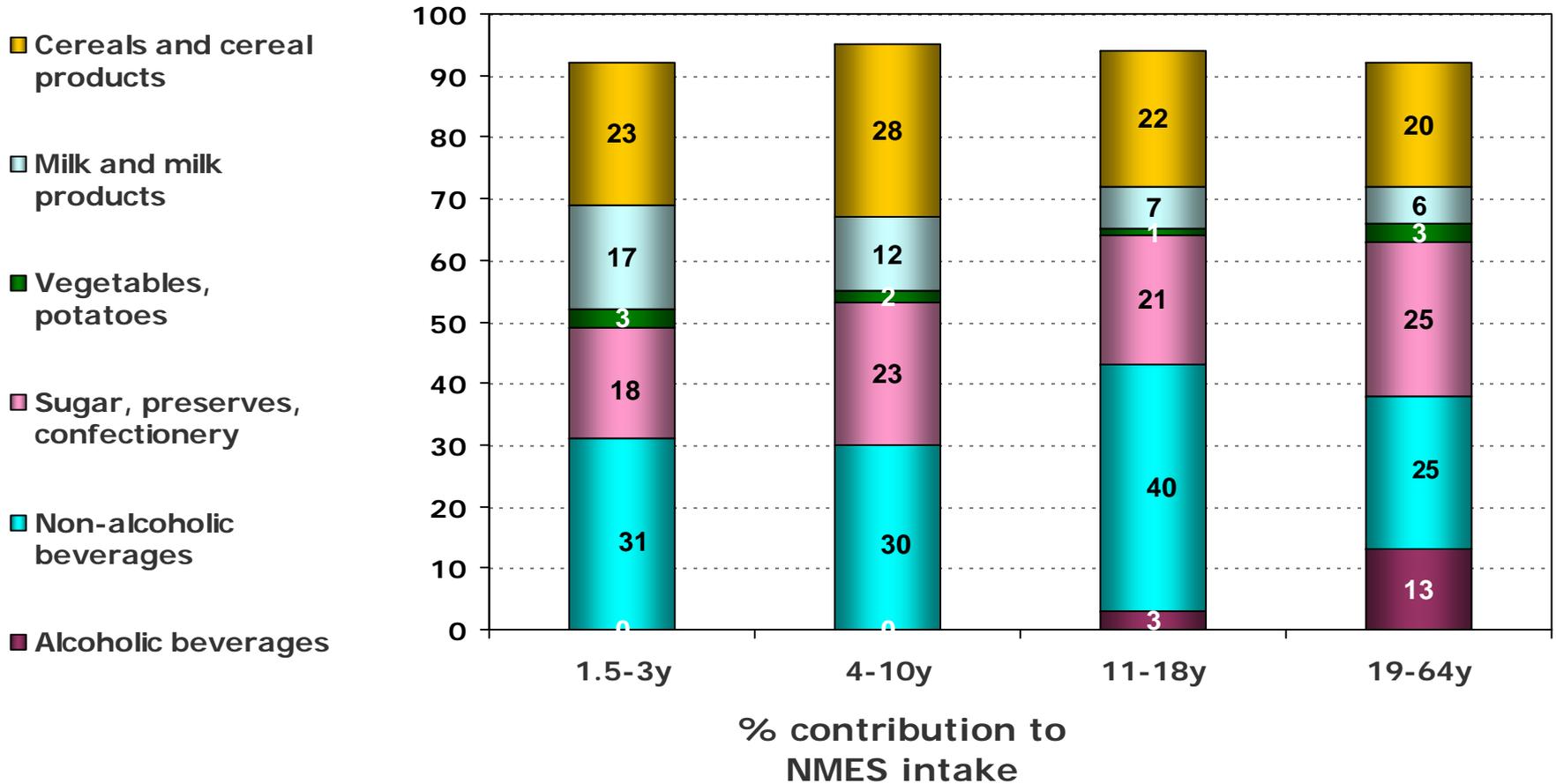


NMES intake Y1 vs earlier surveys

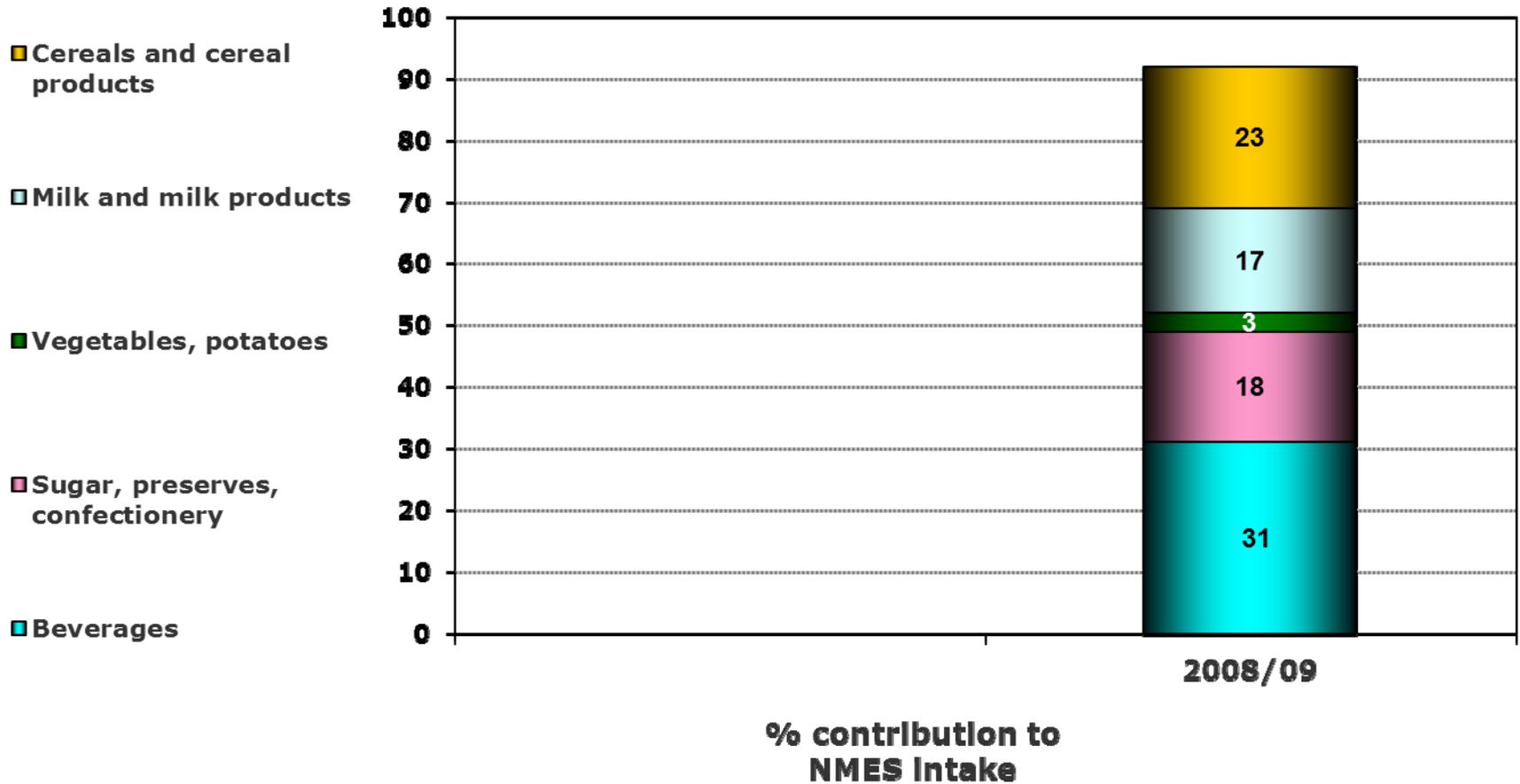


NDNS Y1

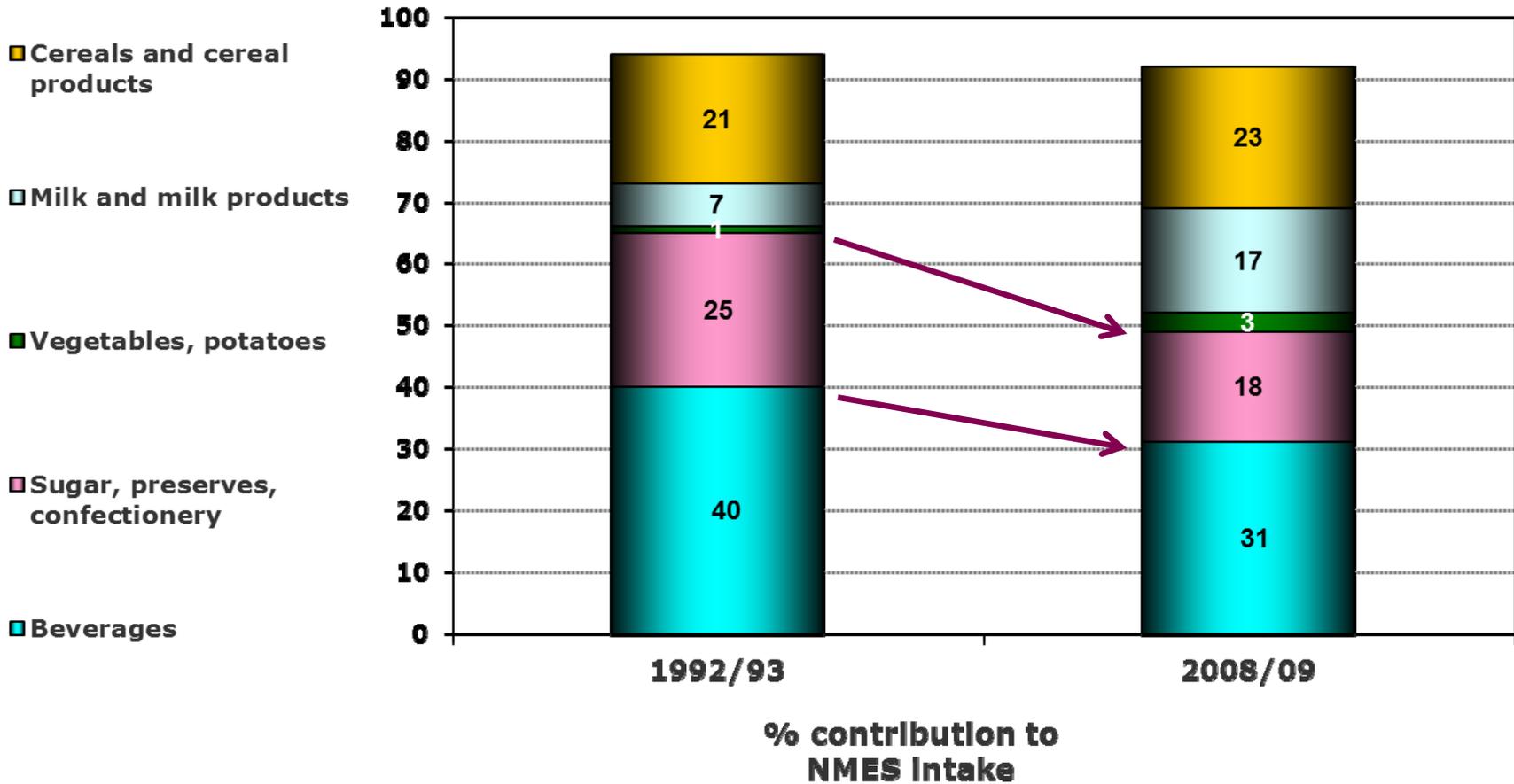
Sources of NMES



NDNS Sources of NMES for toddlers Y1 vs 1992/93

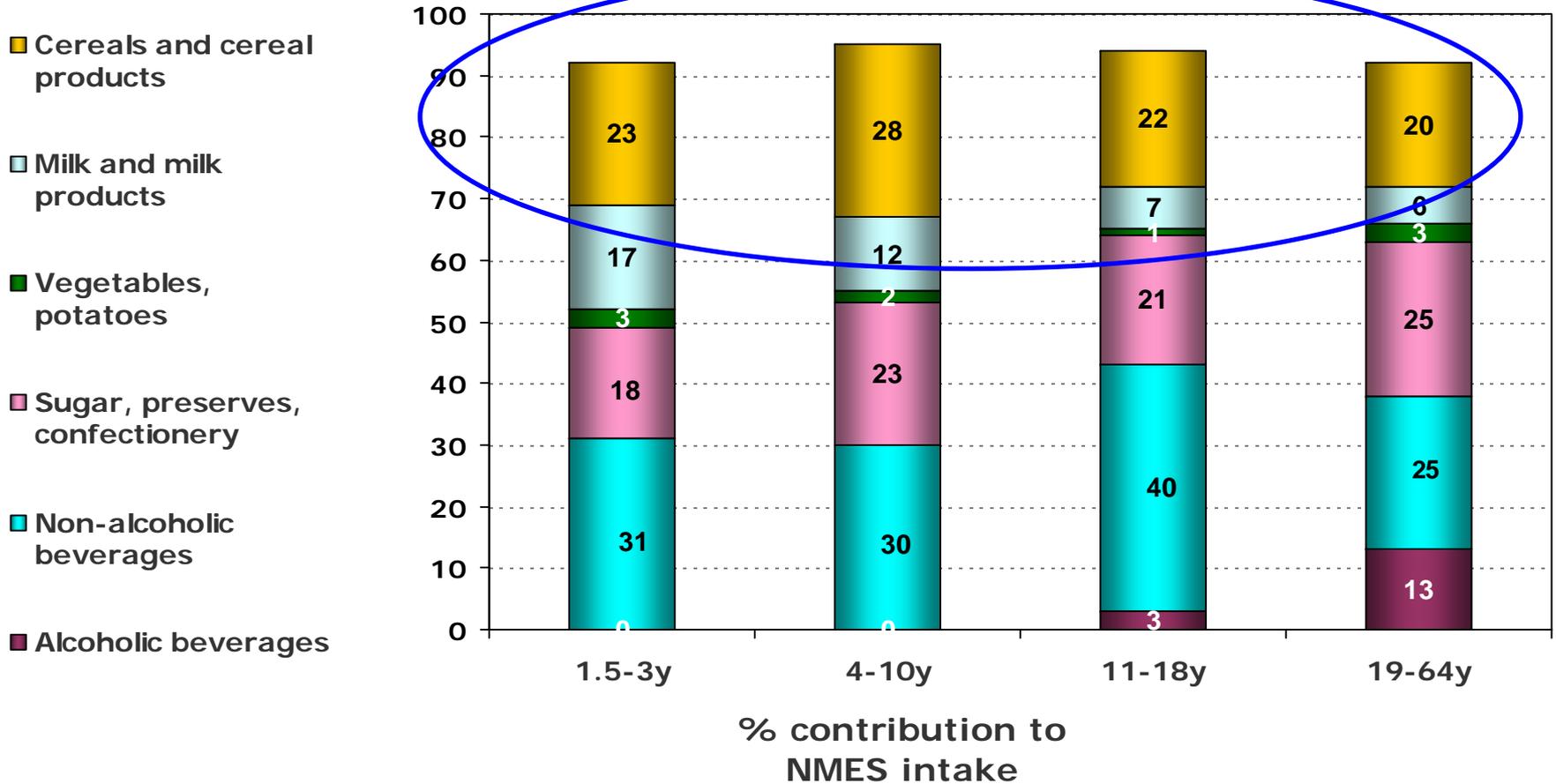


NDNS Sources of NMES for toddlers 2008/09 vs 1992/93



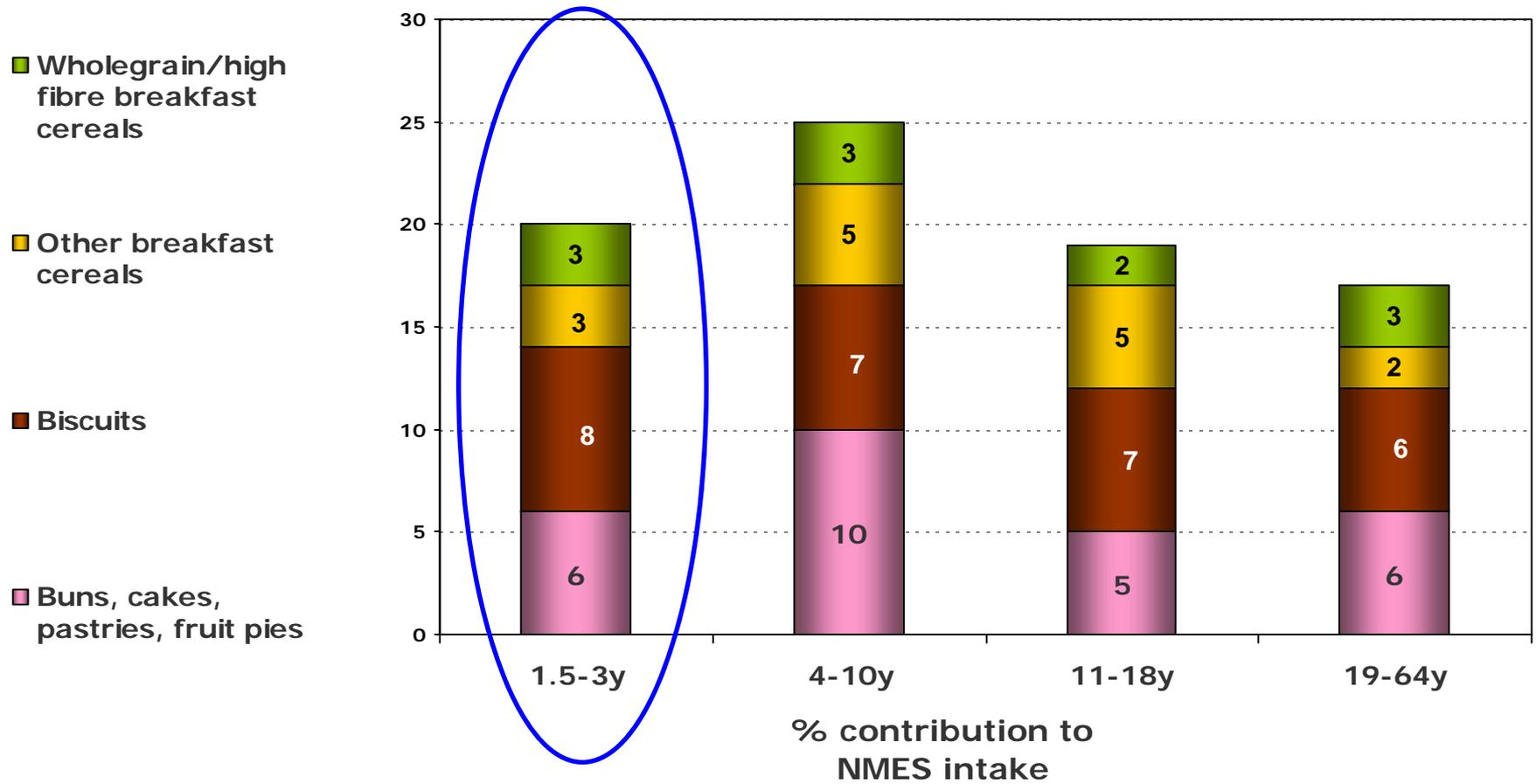
NDNS Y1

Sources of NMES



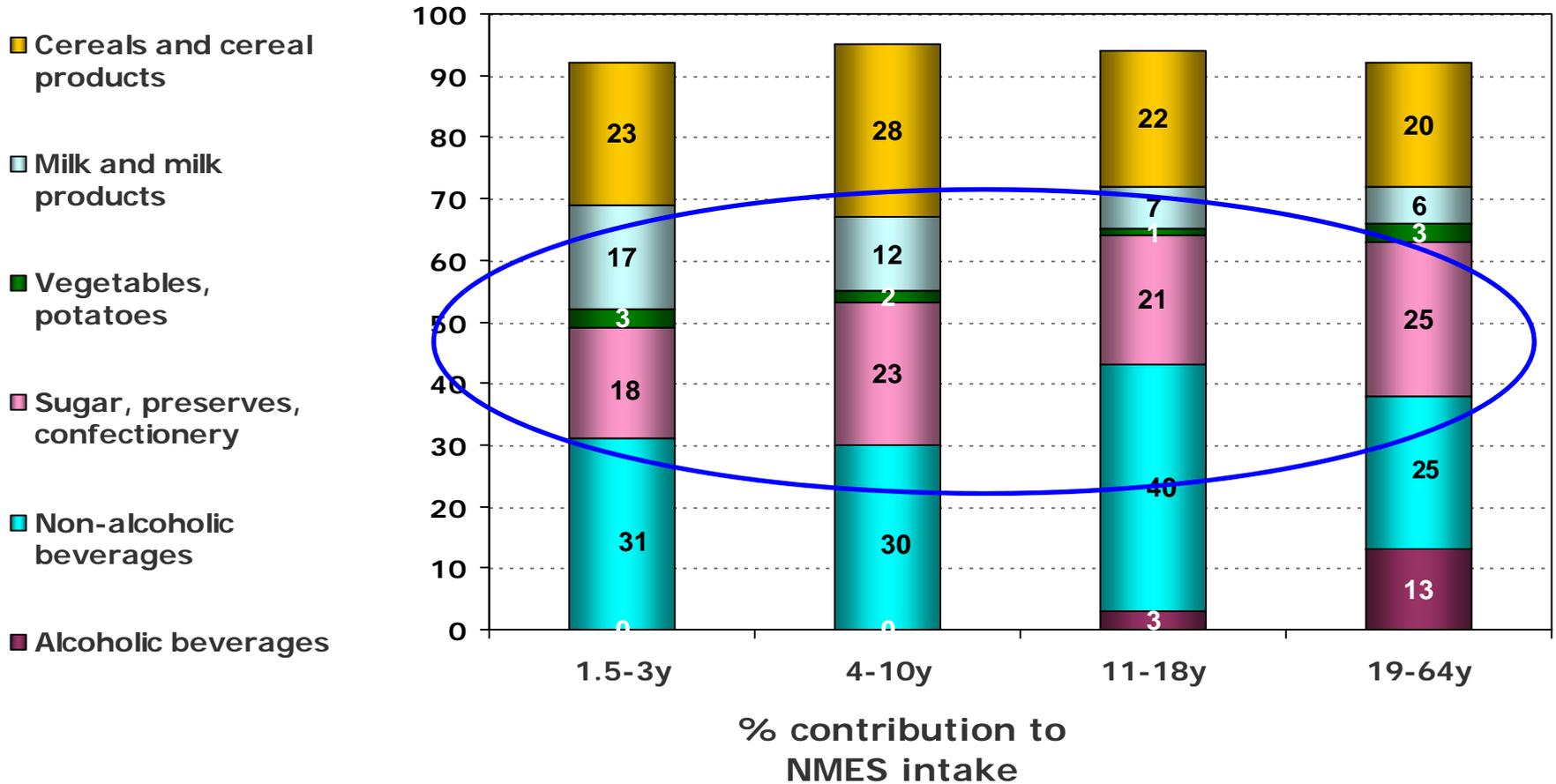
NDNS Y1

Sources of NMES



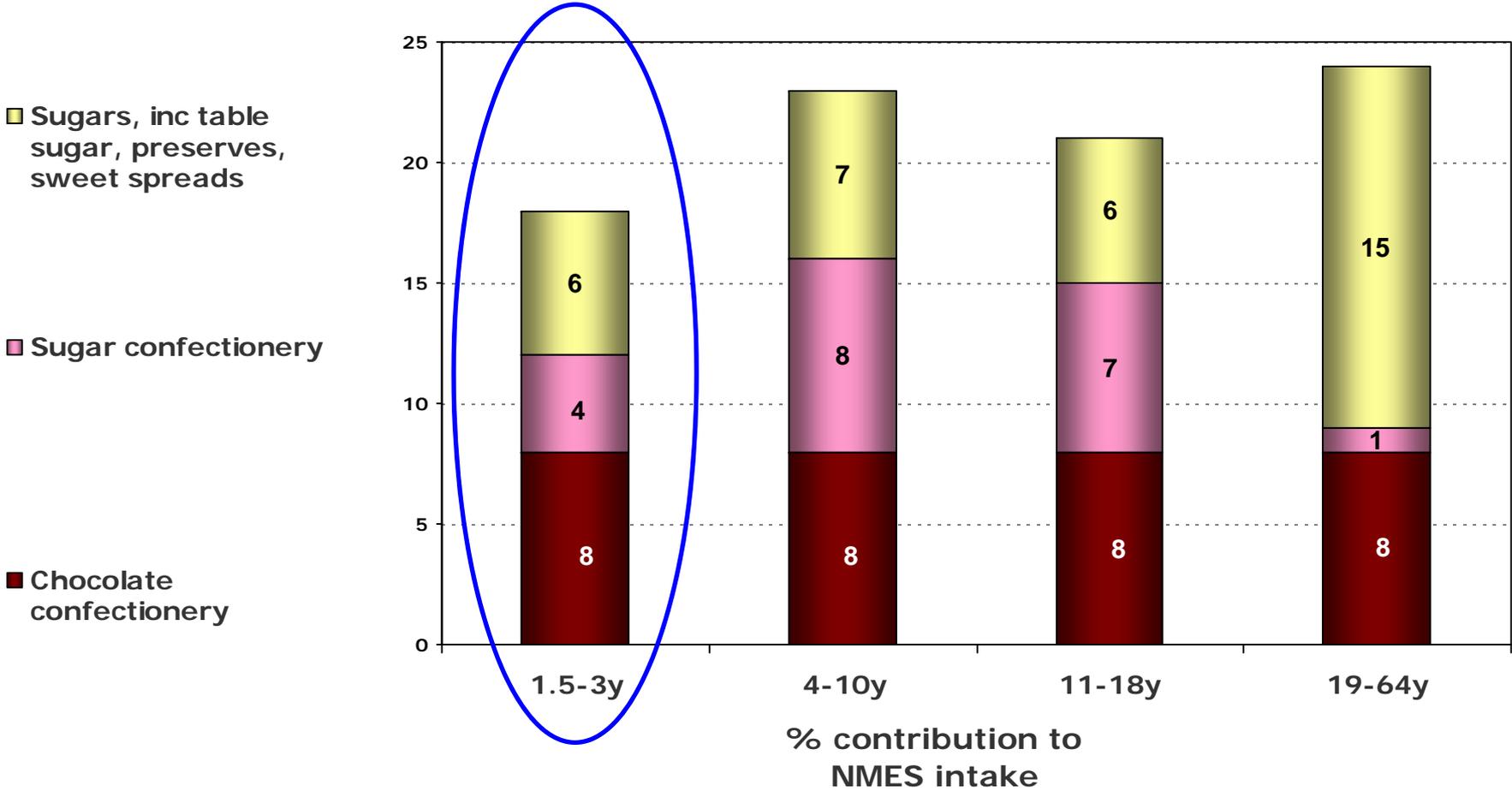
NDNS Y1

Sources of NMES

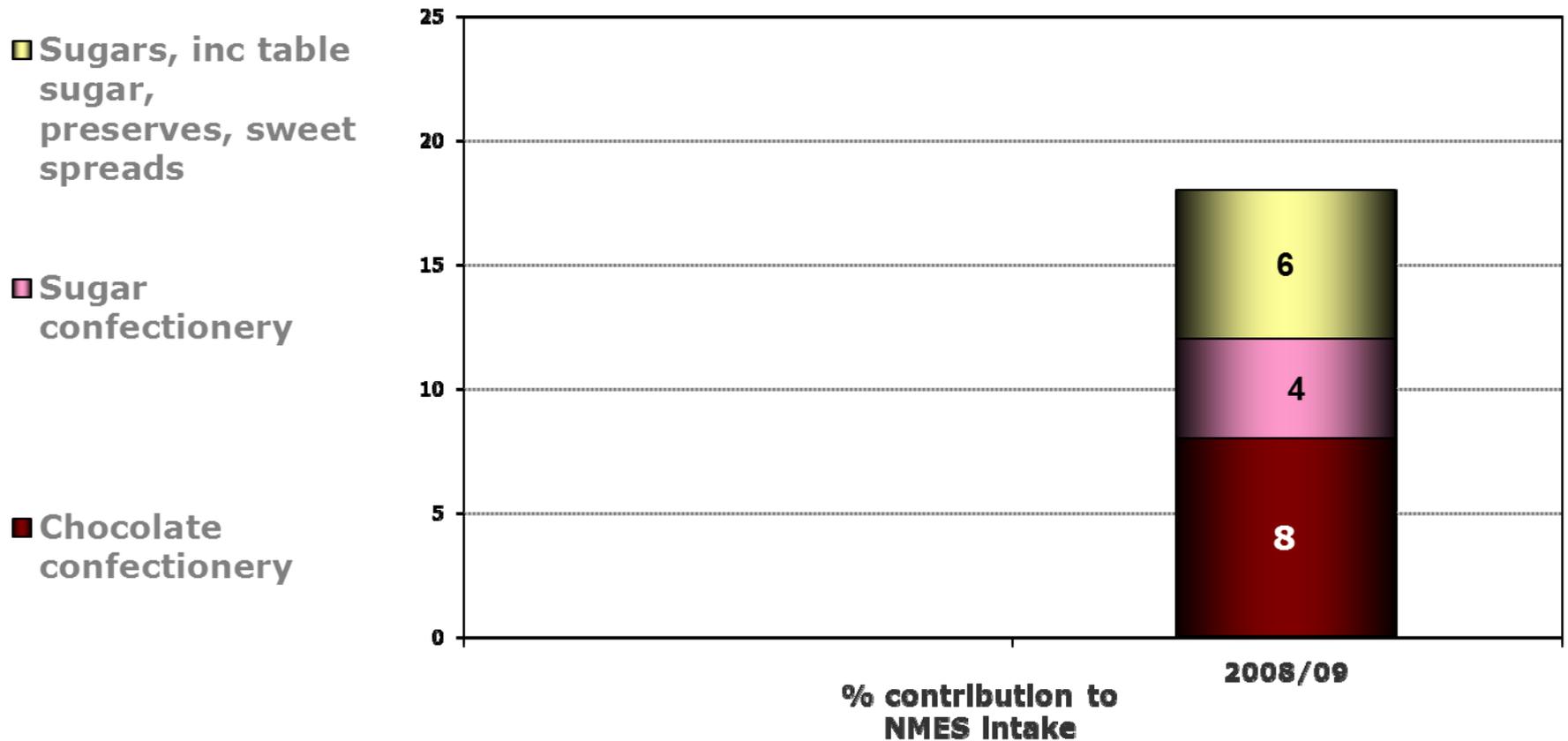


NDNS Y1

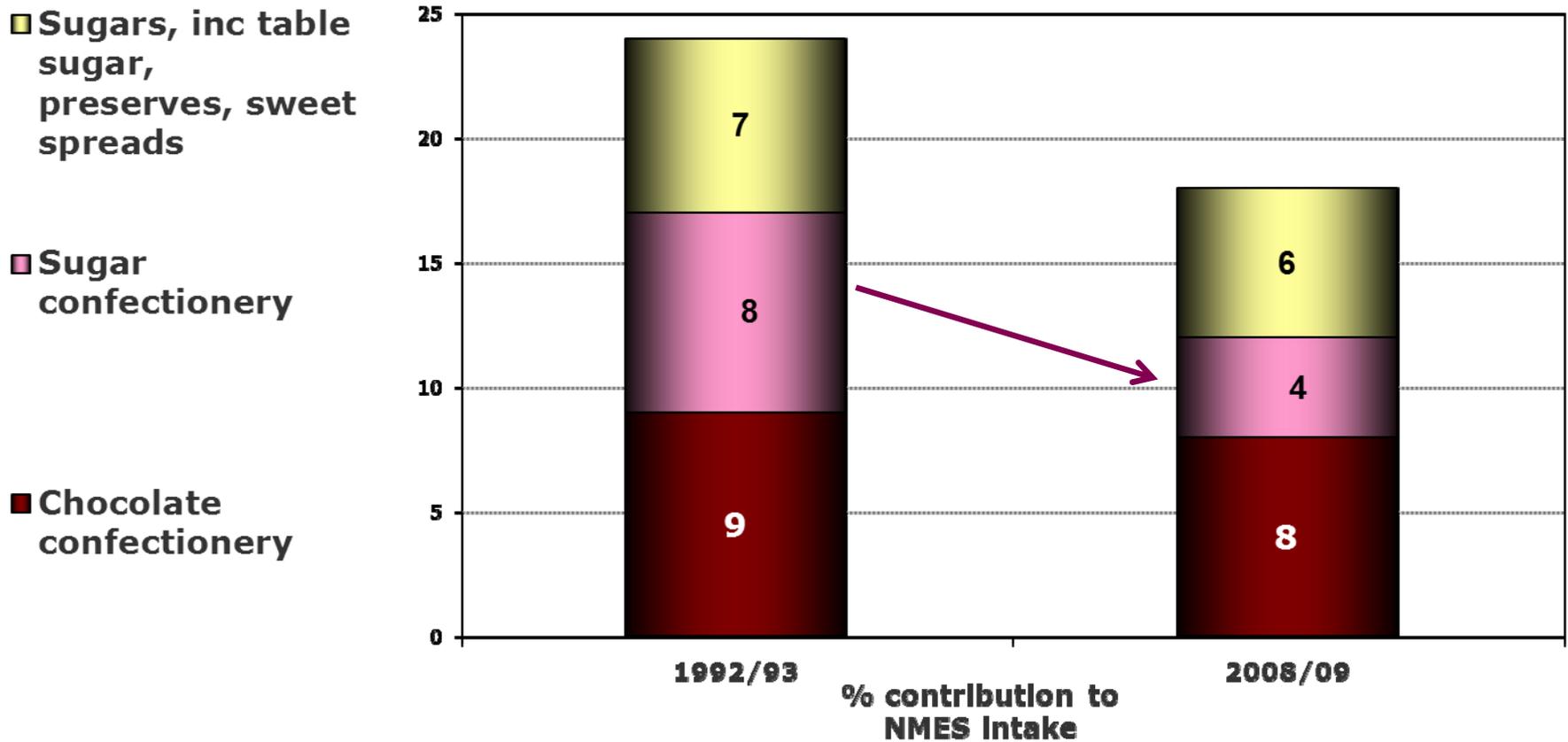
Sources of NMES



NDNS Sources of NMES for toddlers Y1 vs 1992/93



NDNS Sources of NMES for toddlers 2008/09 vs 1992/93

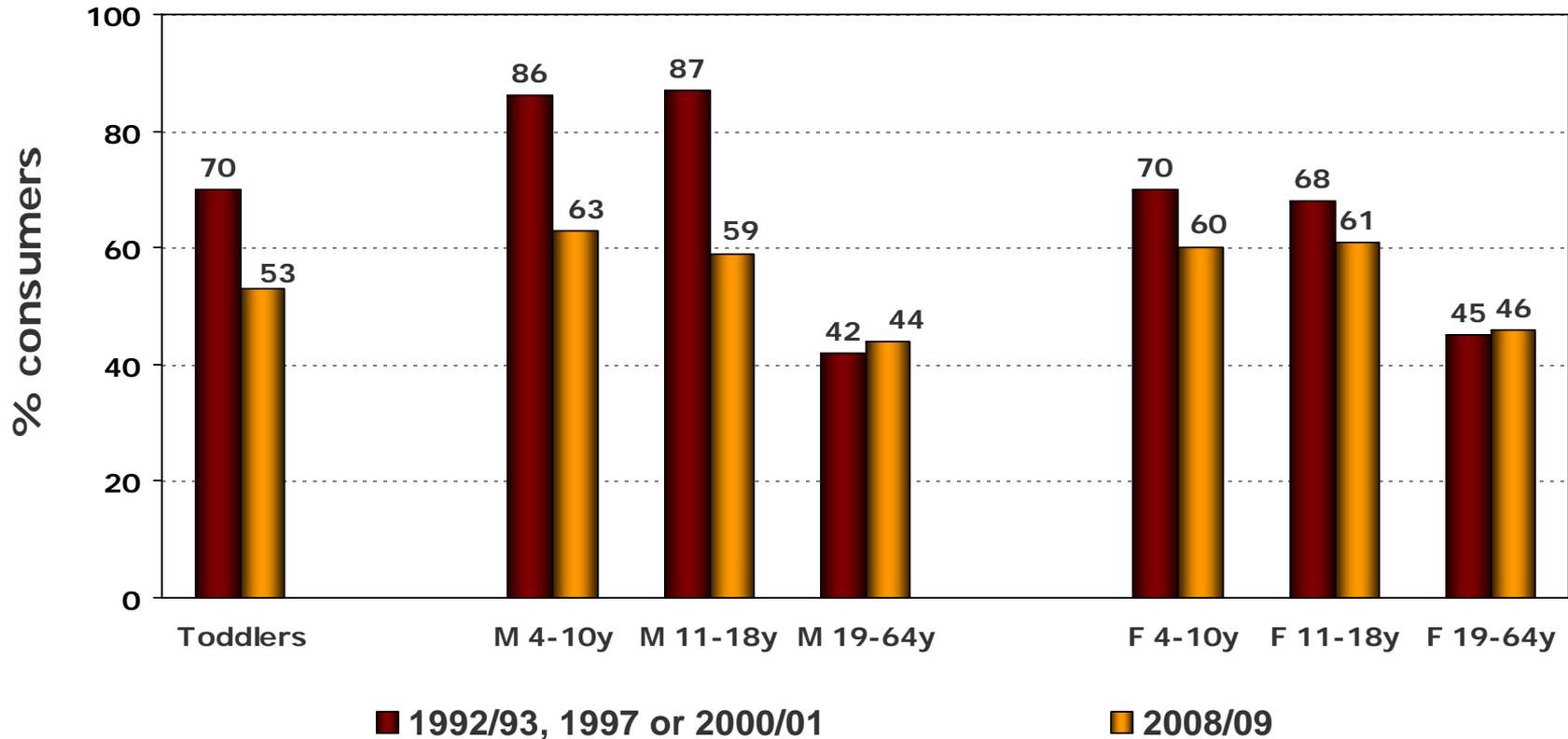




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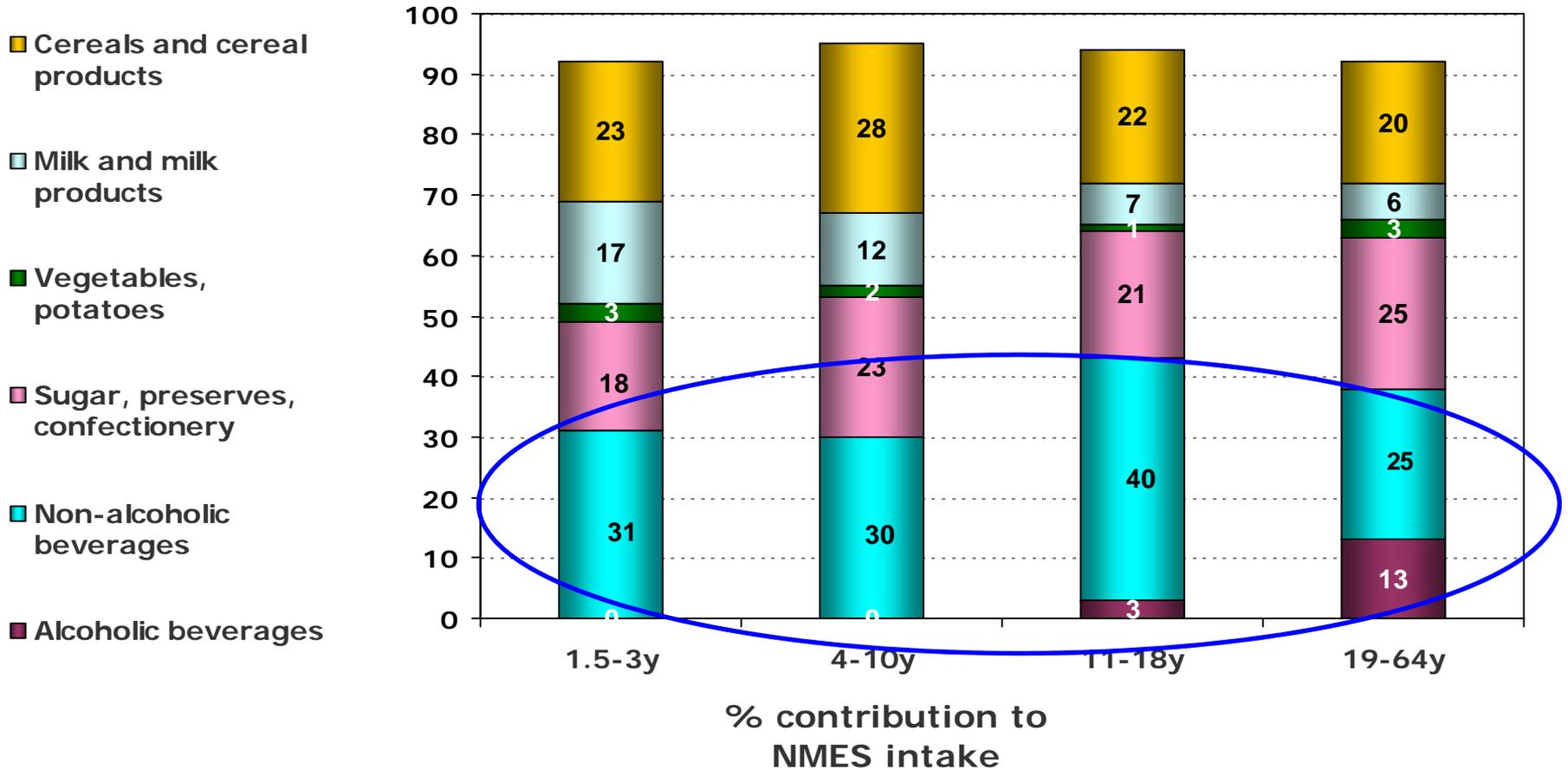
NDNS % consumers – Y1 vs earlier surveys

Chocolate confectionery



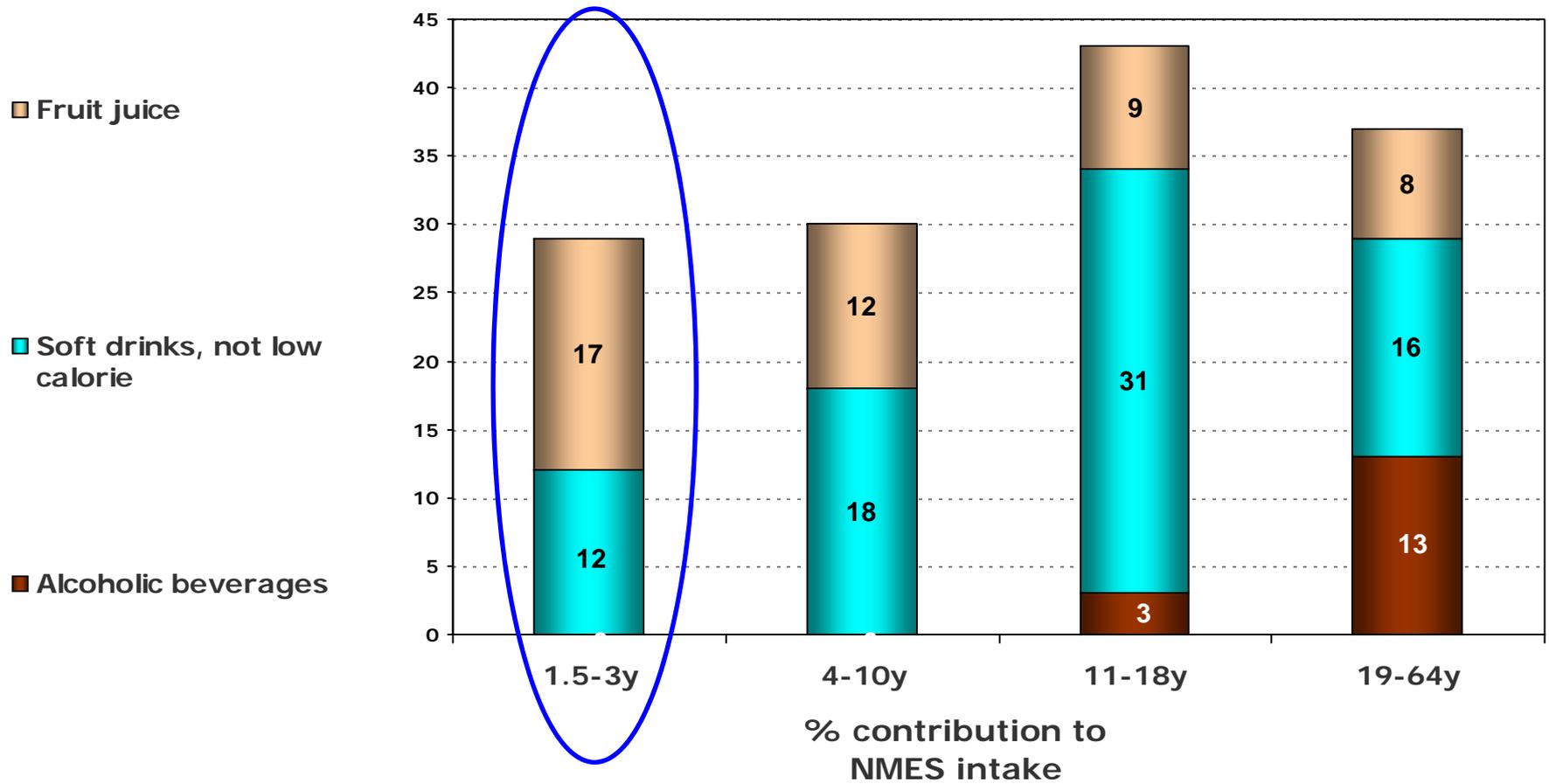
NDNS Y1

Sources of NMES



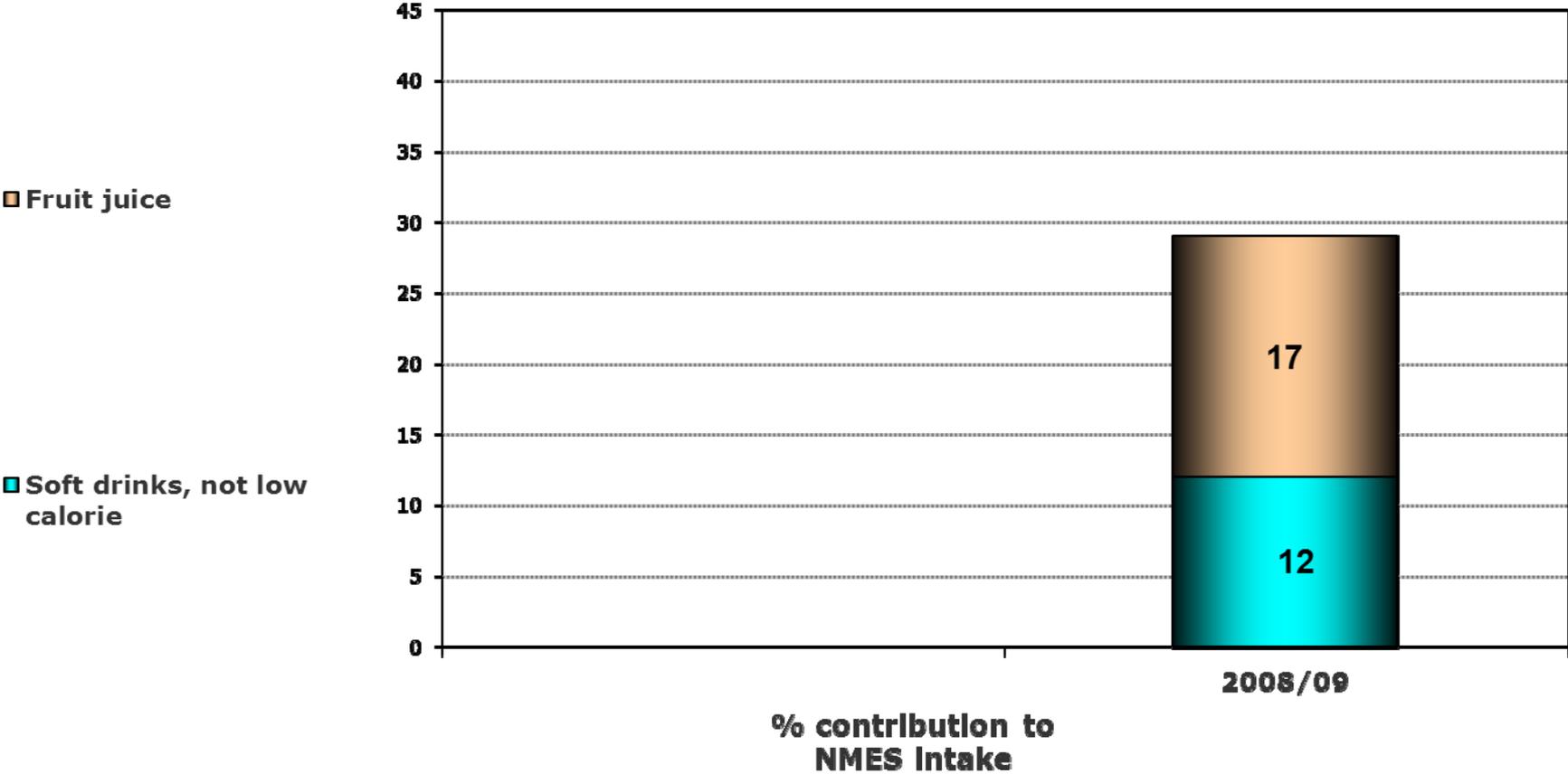
NDNS Y1

Sources of NMES



NDNS Y1

Sources of NMES in toddlers

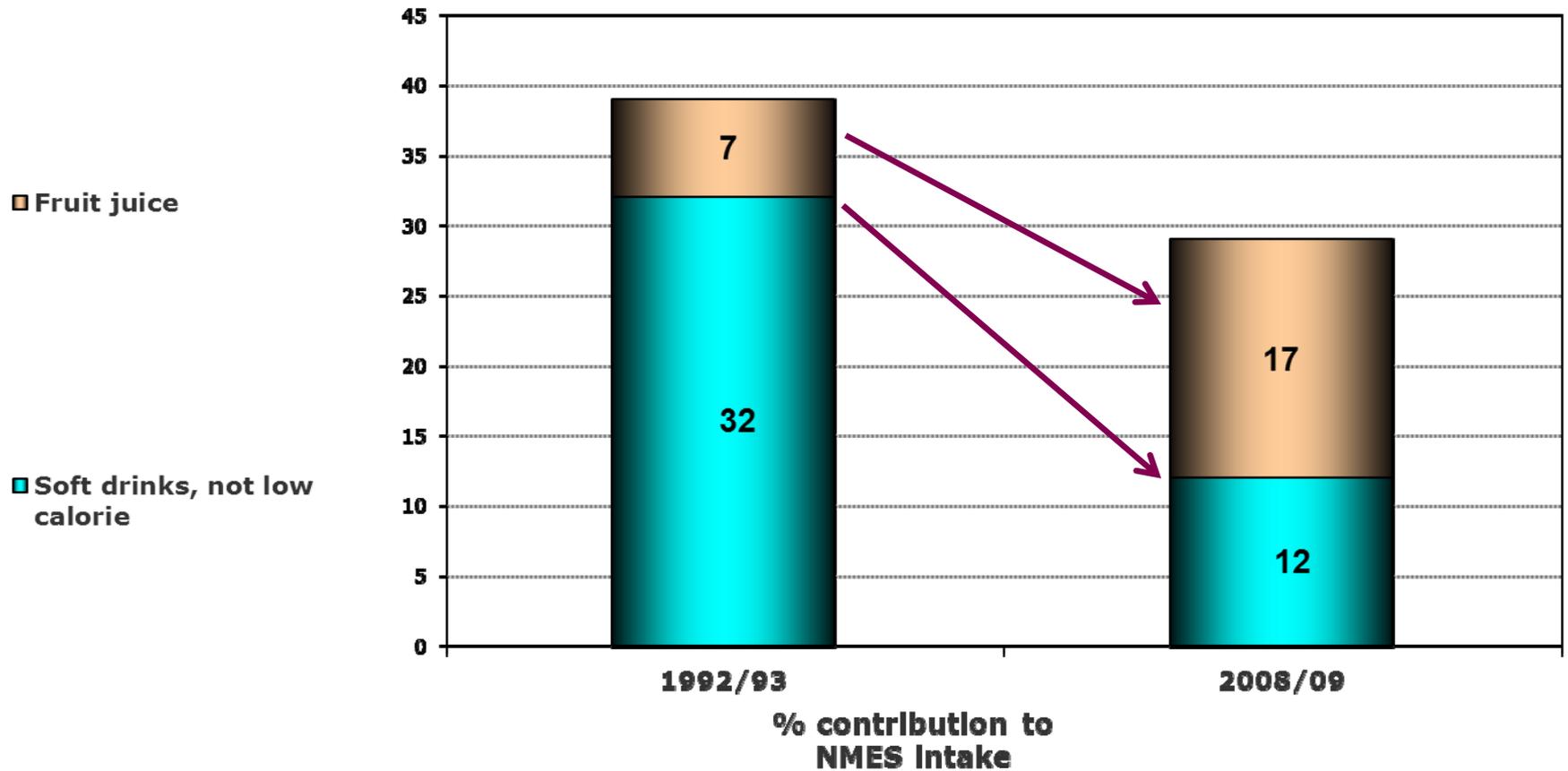




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NDNS Y1

Sources of NMES in toddlers

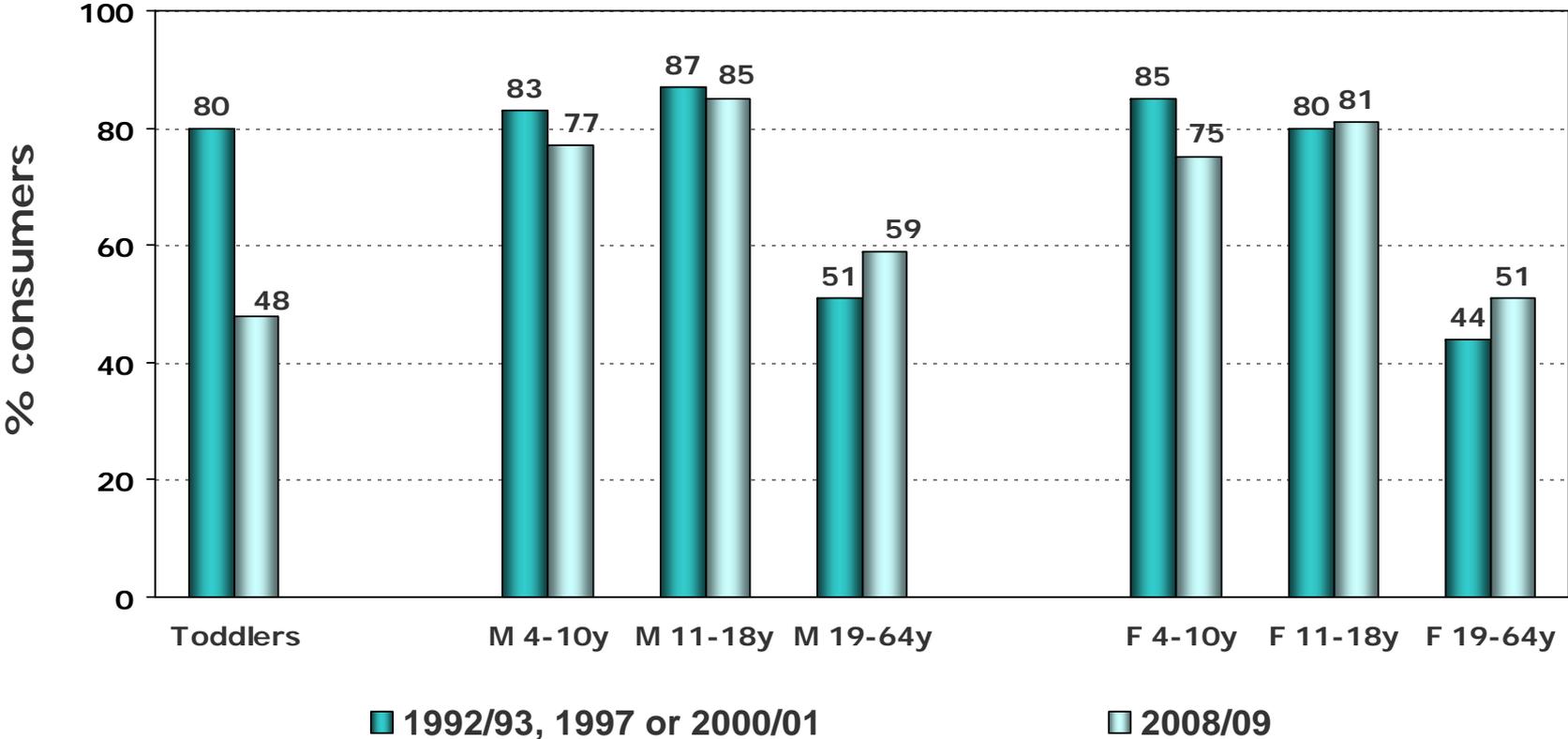




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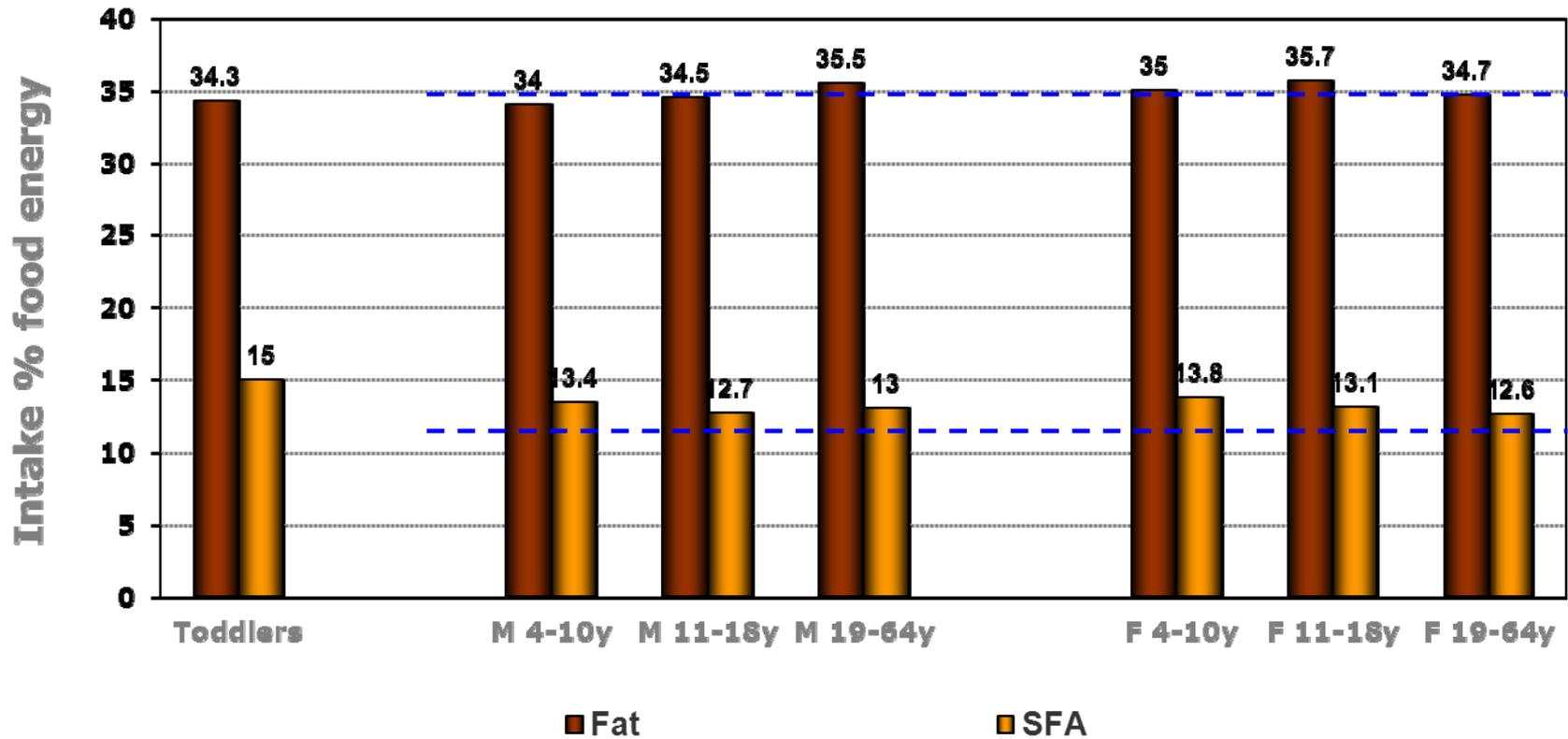
NDNS % consumers – Y1 vs earlier surveys

Soft drinks, not low calorie

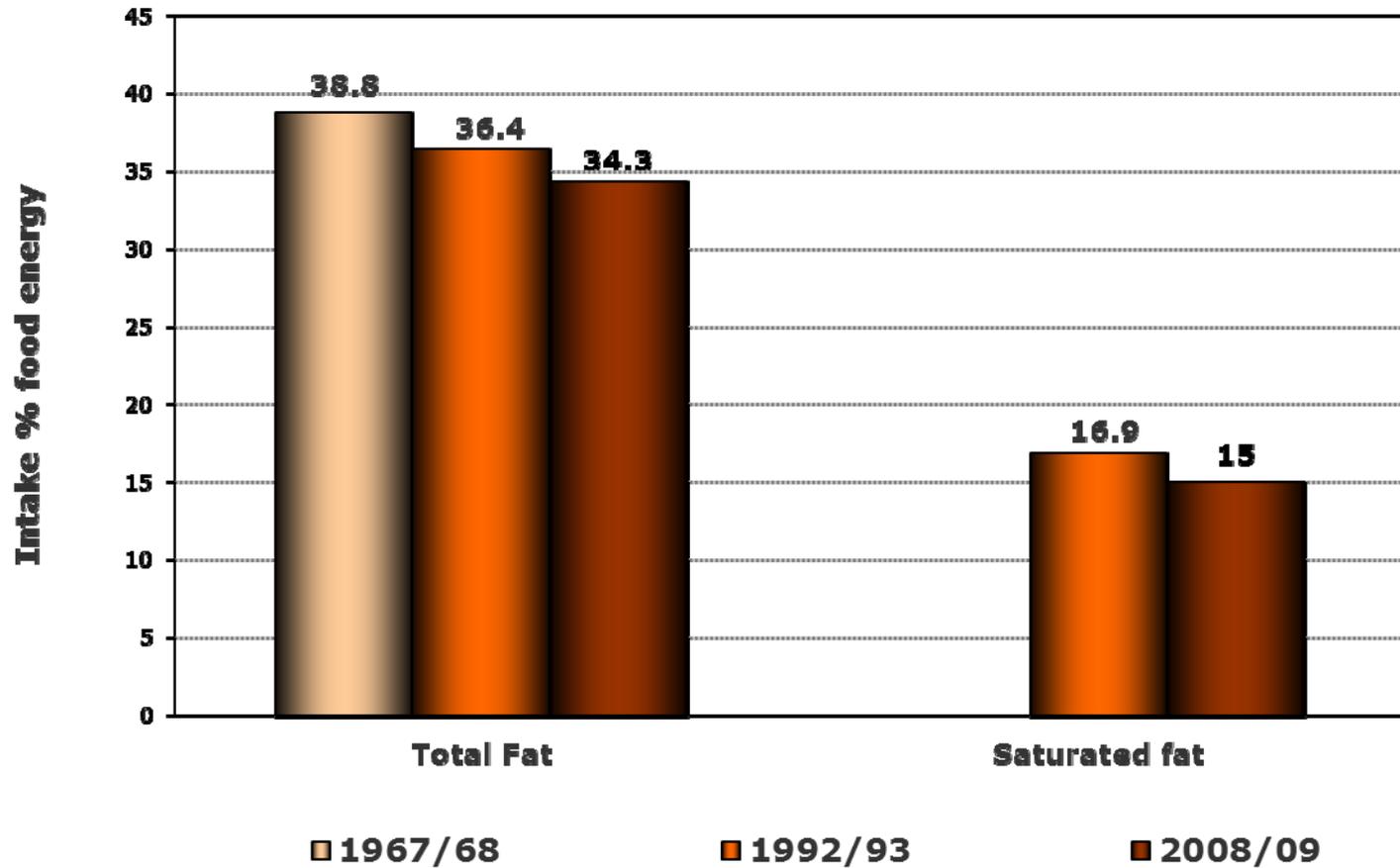


NDNS Y1

Fat and saturated intake % food energy

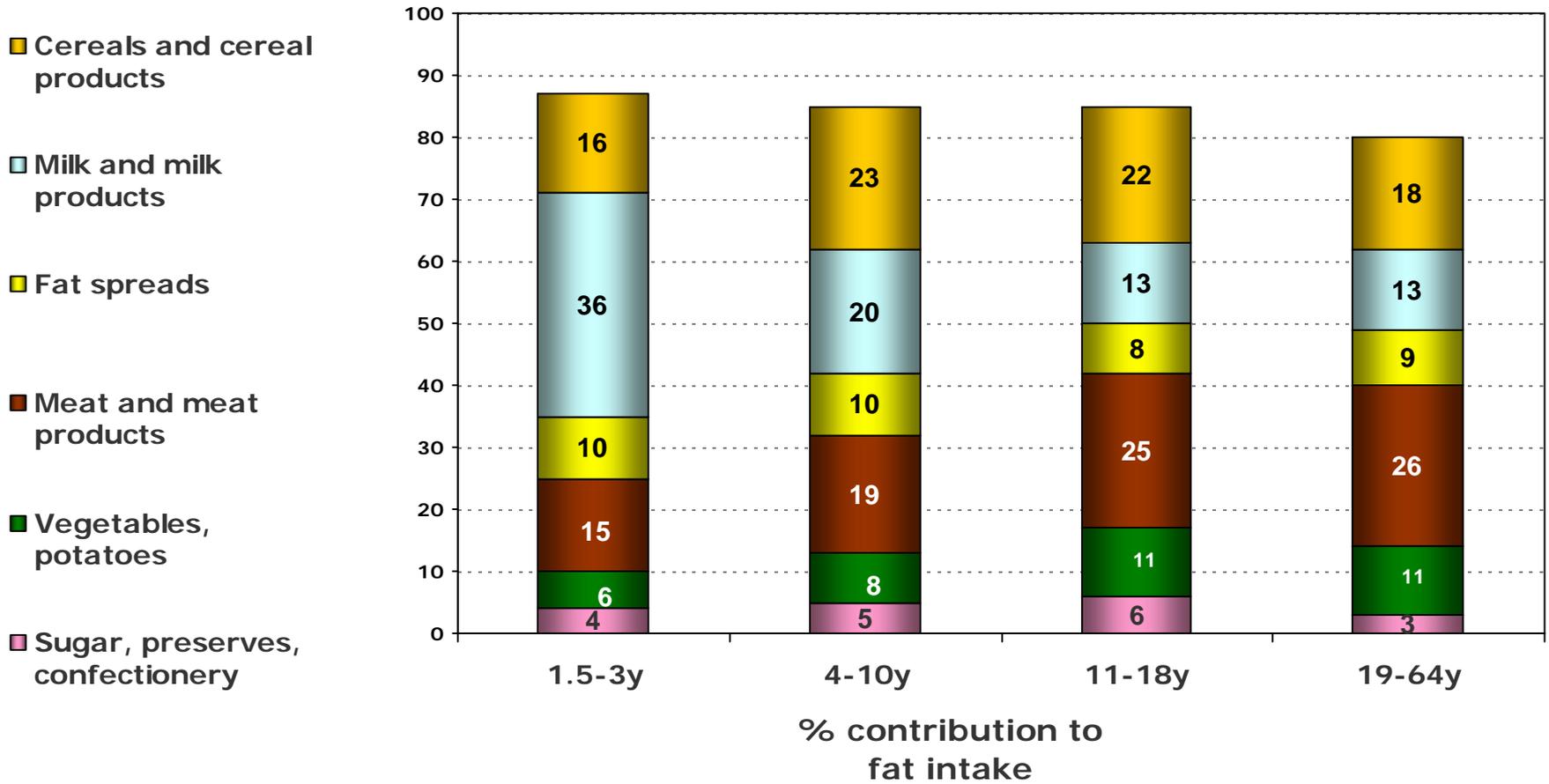


NDNS Fat intake % food energy for toddlers



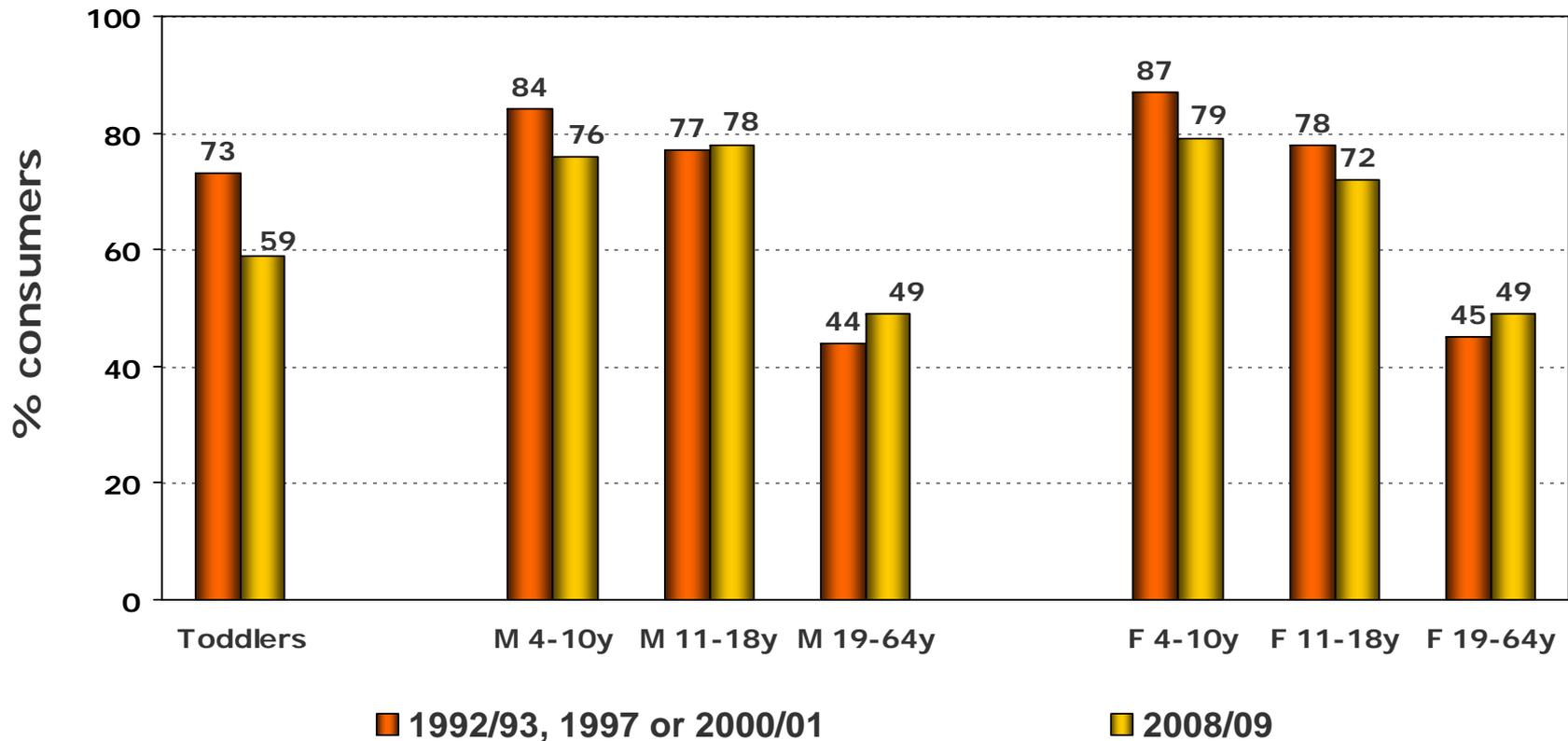
NDNS Y1

Sources of total fat



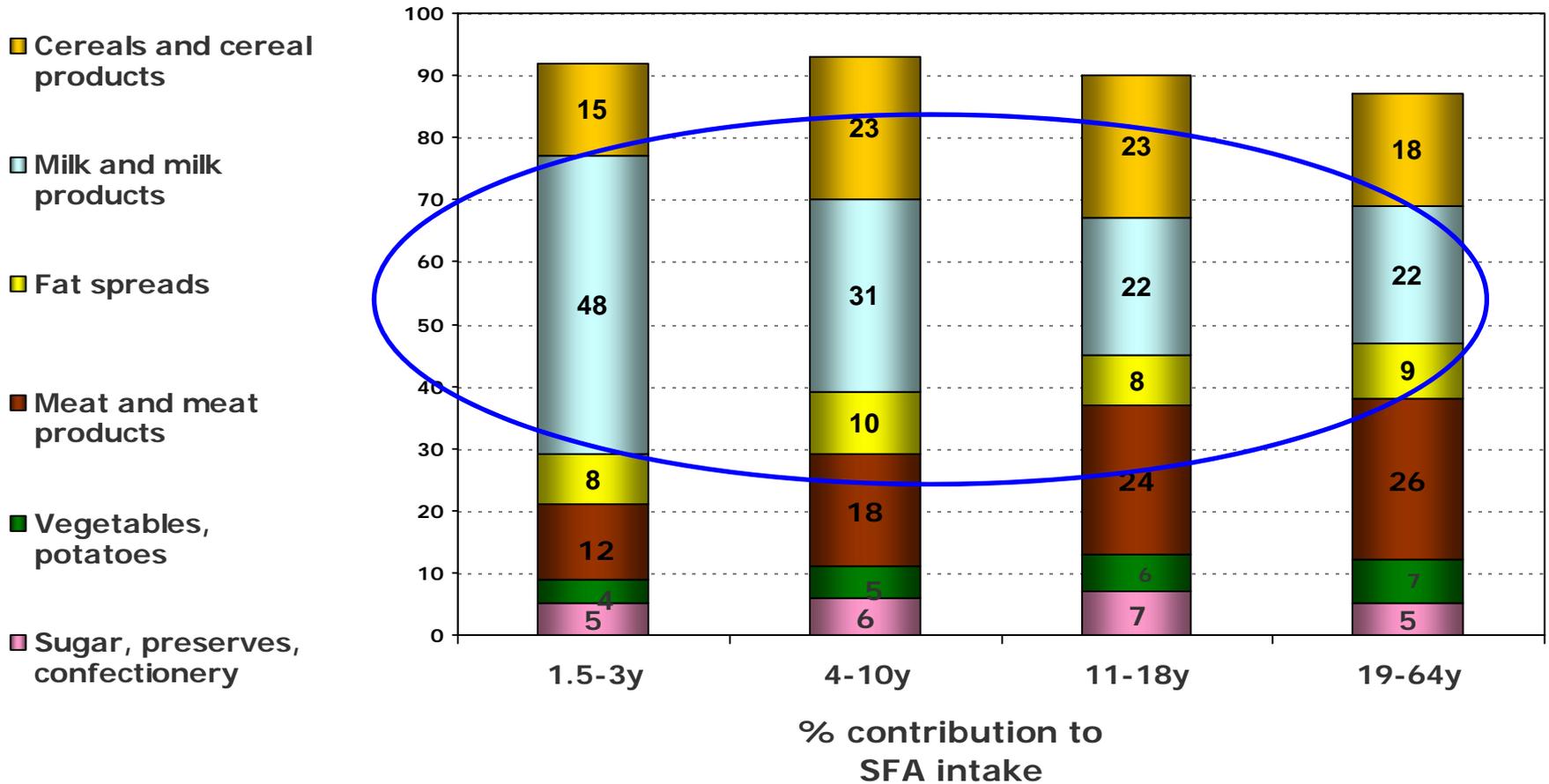
NDNS % consumers – Y1 vs earlier surveys

Savoury snacks



NDNS Y1

Sources of saturated fatty acids

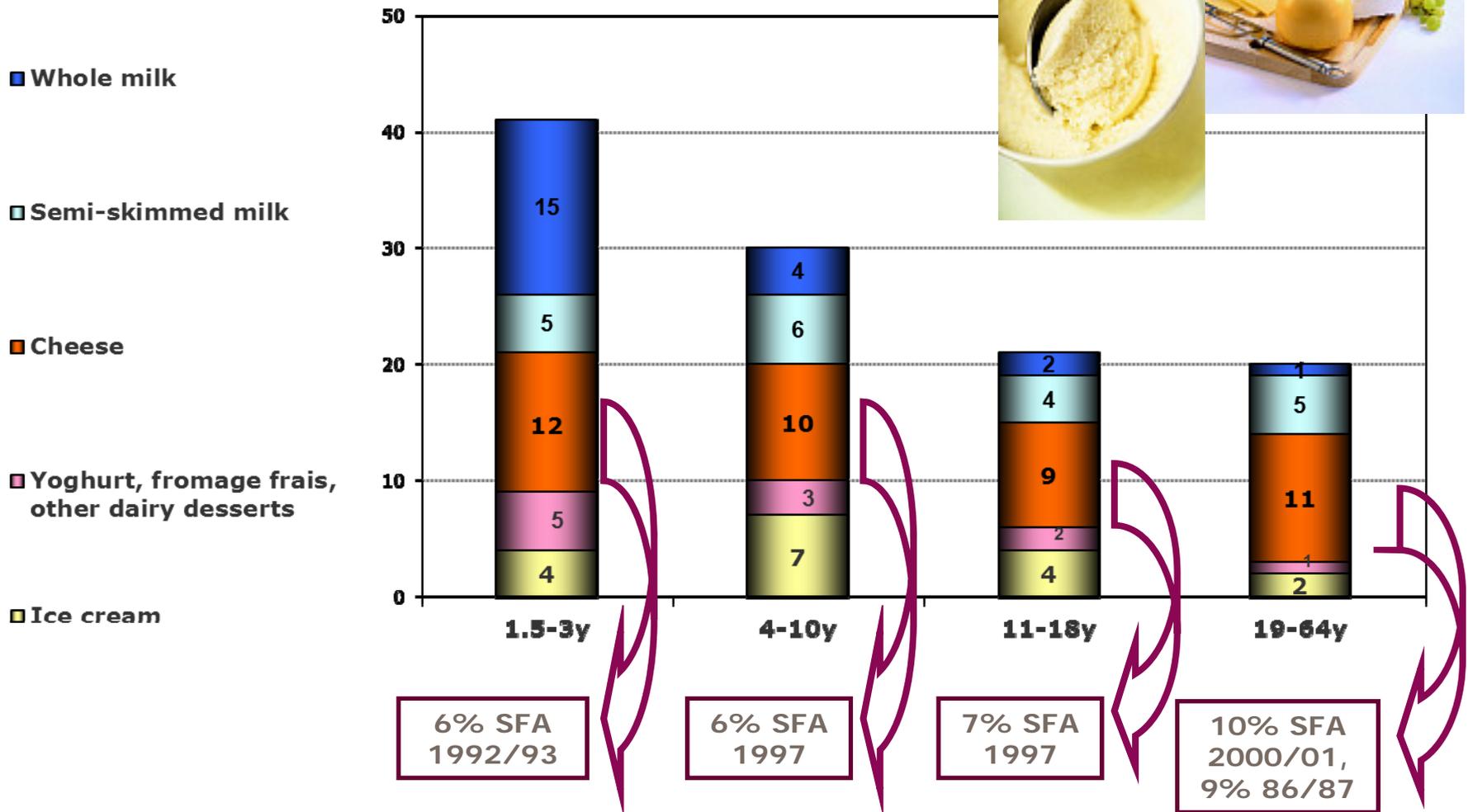




Grab your
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NDNS Y1

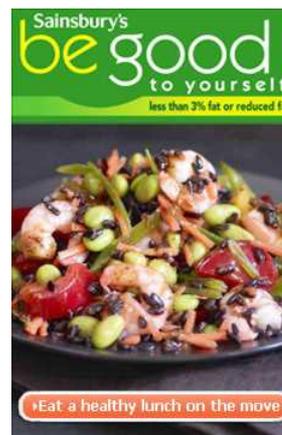
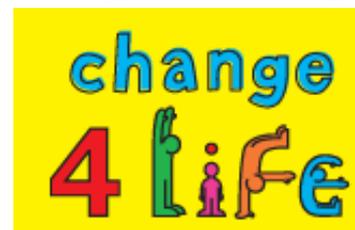
Sources of saturated fatty acids



Why do diets of toddlers and young children appear to have improved?

Campaigns to improve diet

- Campaigns to increase fruit and veg consumption
- Campaigns to counter obesity
- Supermarket programmes to encourage healthy eating



Why do diets of toddlers and young children appear to have improved?



Making fruit and veg more available

- Health Start vouchers
- Convenience store C4L campaign
- School fruit scheme
- Healthy products for infants and toddlers



5 A DAY school scheme

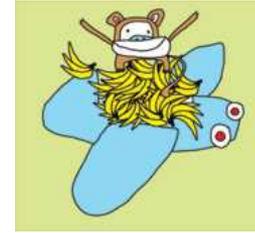


The School Fruit and Vegetable Scheme (SFVS) helps your child achieve 5 A DAY.



Why do diets of toddlers and young children appear to have improved?

- Availability of information and advice for mothers
 - Internet
 - Supermarkets and other stores



Sainsbury's

Little Ones

baby & toddler club



Feeding the under 3s
the food they need

www.littlepeoplesplates.co.uk



Welcome
to Boots Parenting Club

Whether you're a member or not, you can take advantage of the great support from the UK's most generous parenting club. Why not browse our site for information on everything from trying for a baby to teen health?

[Find out more or join now >](#)

* terms & conditions apply



- Television programmes promote healthy eating



NDNS year 2 report

- Available on web June-July 2011
- Y1 and Y2 together
- 4 days of record, with random start days
- ~ 250 1.5-3y

Diet and Nutrition Survey of Infants and Young Children



- food and nutrient intakes, sources of nutrients, nutritional status of a representative sample of 1800 4-18 months from the UK population
- detailed information on breast and breast milk substitutes consumed
- characteristics of subjects with intakes and/or status of specific nutrients above and below national reference values
- blood indices for nutritional status, or dietary biomarkers to relate to dietary, physiological and social data

DNSIYC – Comparison with NDNS

- Not rolling – little opportunity to change after Dress Rehearsal
- 1800 subjects
- Different sampling frame – Child Benefit Register
- 5 months fieldwork because of availability of sample
- Dietary assessment similar
- Similar dietary feedback
- Stable isotope method for breast milk volume estimation
- Use of clinics rather than nurse visiting home – necessitated by paediatric phlebotomy experience
- Mobile unit for rural areas – due to difficulty with paediatric phlebotomy by home nurses



DNSIYC Dress Rehearsal

- February – June 2010
- 188 subjects 4-18 months

Age	4-6m	7-9m	10-11m	12-18m	All
Number	23	32	28	105	188

- 4 locations – Cambridge, Newcastle, Manchester, Falkirk (mobile unit for clinic)
- 4 day estimated diary



What influences what young children eat?

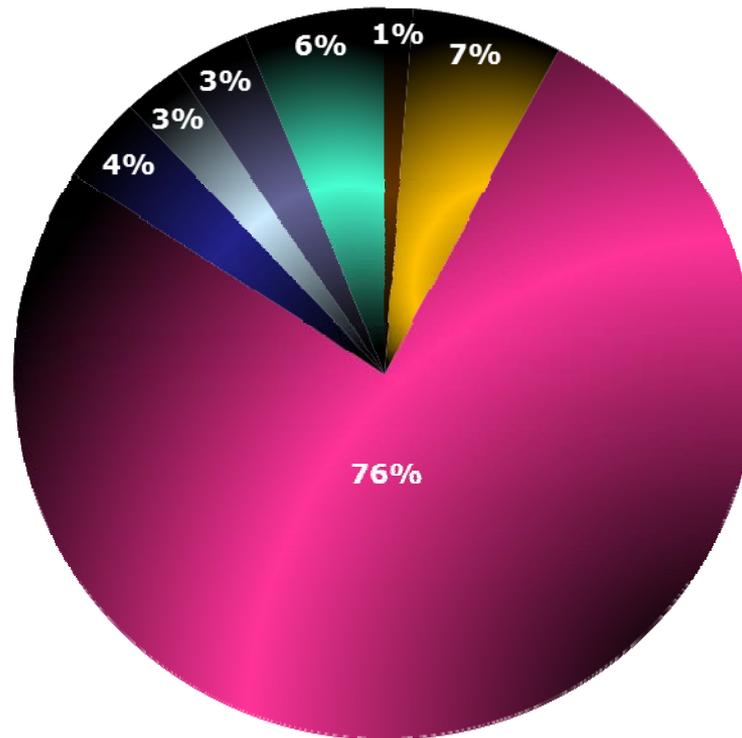
- **Preferences, food availability and accessibility**
 - Children's preferences
 - Parents' preferences, beliefs and attitudes
 - Availability /accessibility
- **Mealtime Structure**
 - Social context of meals – the family
 - TV viewing
 - Eating out
 - Portion size
 - Feeding styles
- **Socioeconomic and cultural factors**
 - Time constraints, education and income
 - Ethnicity and culture

Patrick H & Nicklas TA J Amer Coll Nutr 24: 83-92 2005

Diary Page Example

Day 1 SATURDAY		Date 20-3-10		
Time	Where? With Whom? TV on? At table?	Food/Drink description & preparation	Brand Name	Portion size or quantity <u>eaten</u>
How to describe what your child had and how much can be found on pages 30-35 in Instruction Booklet				
6am to 9am				
7.45am	At home, in a highchair at the table. With Mum and Dad. TV on.	200ml bottled water 1 medium banana 4 tablespoons (measuring spoons) Rice Krispie multigrain shapes 1/2 scotch pancake with butter and jam	Tesco Fyffes Kellogs Morrisons	Drank 100mls water. Ate all of the banana and cereal. Didn't eat the scotch pancake.

Location of eating DNSIYC dress rehearsal



- Carer's home
- Friend's or Relative's house
- Home
- Nursery/Kindergarten
- Eating establishment
- Other away from home
- Unspecified

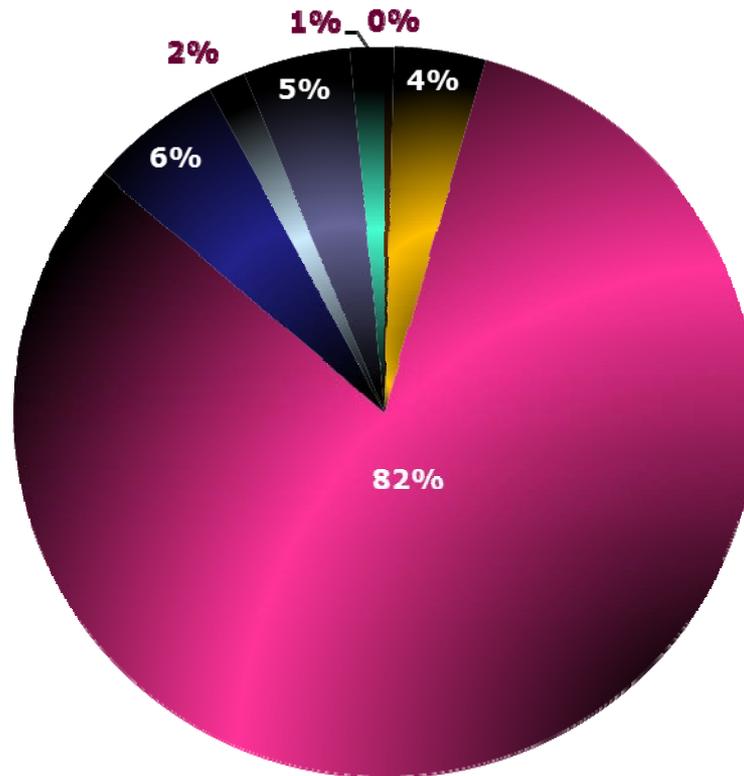
**% foods consumed in various locations
15675 foods for 188 infants 4-18 months**





Grab your
voting
pads...

Location of eating NDNS Y1 1.5-3 y

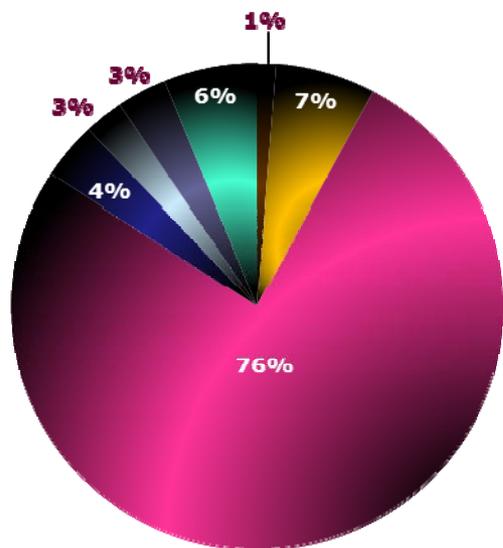


- Carer's home
- Friend's or Relative's house
- Home
- Nursery/Kindergarten
- Eating establishment
- Other away from home
- Unspecified

% foods consumed in various locations
7204 foods for 121 toddlers 1.5-3y

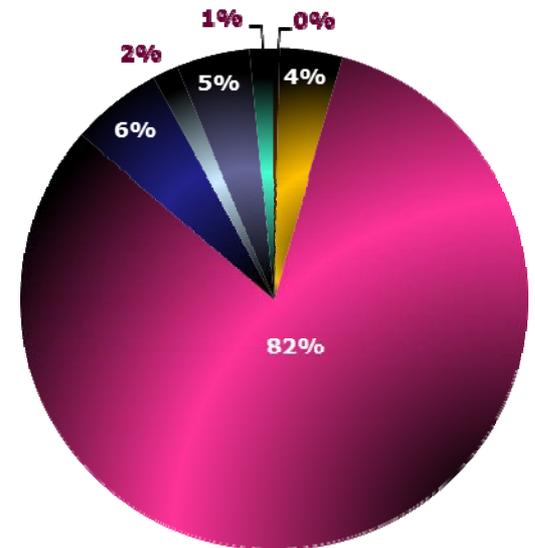
Location of eating

NDNS Y1 1.5-3 y vs DNSIYC



15675 foods for 188 Infants 4-18 months

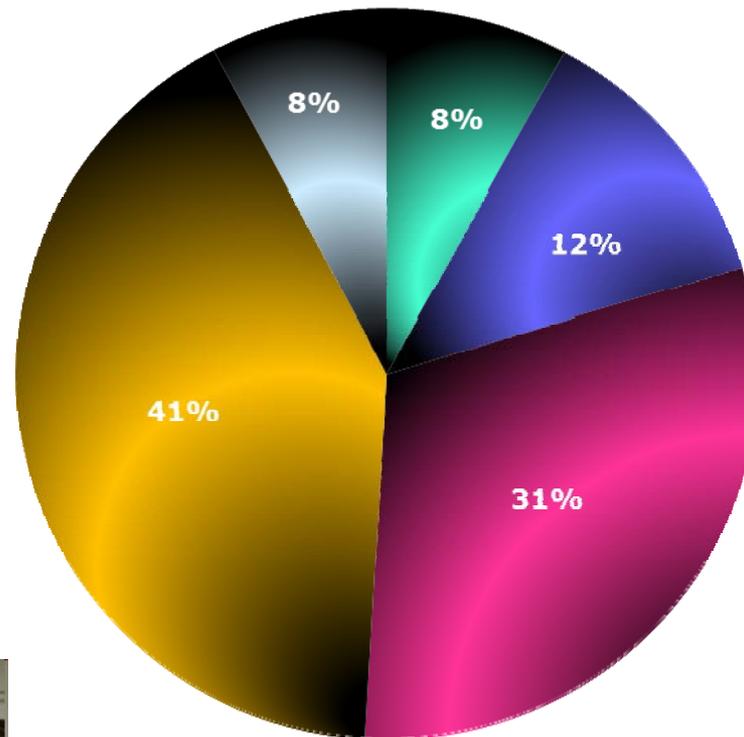
- Carer's home
- Friend's or Relative's house
- Home
- School/Nursery/Kindergarten
- Eating establishment
- Other away from home
- Unspecified



7204 foods for 121 toddlers 1.5-3y

% foods consumed in various locations

Location of eating DNSIYC dress rehearsal

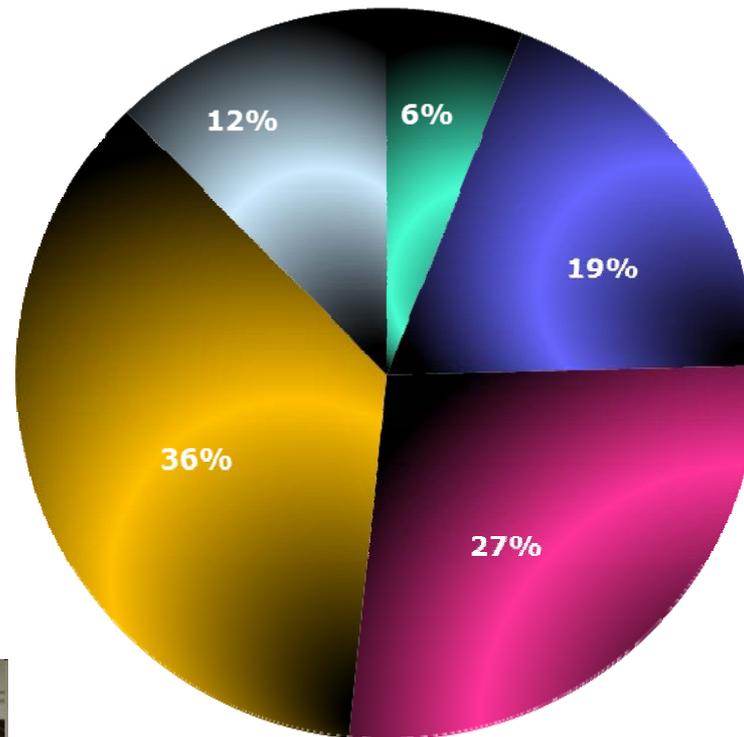


- Home - Bedroom
- Home - Dining Room
- Home - Kitchen
- Home - Living Room
- Home - Other

% foods consumed in various locations
15675 foods for 188 infants 4-18 months



Location of eating NDNS Y1 1.5-3 y



- Home - Bedroom
- Home - Dining Room
- Home - Kitchen
- Home - Living Room
- Home - Other

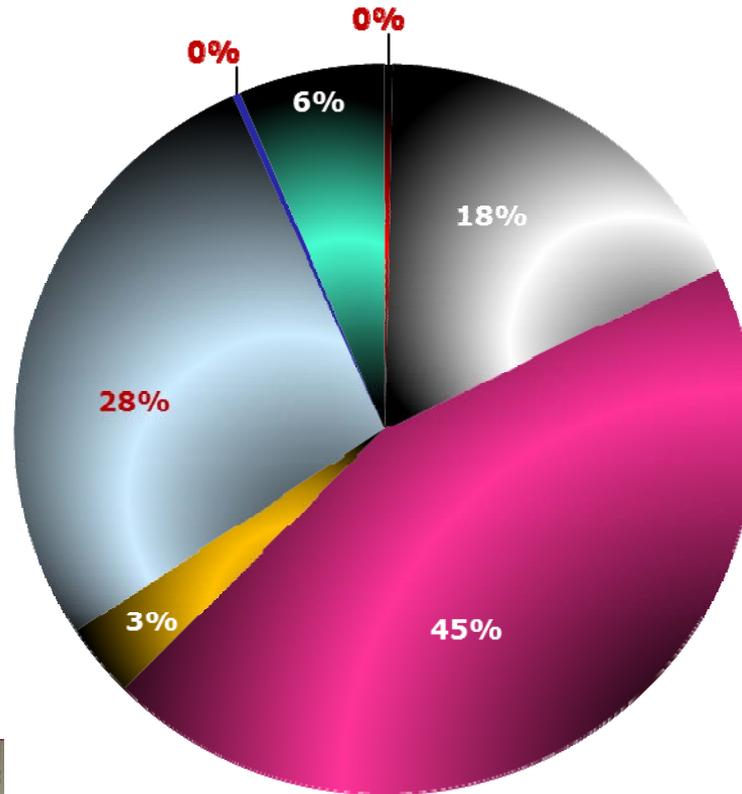
% foods consumed in various locations
7204 foods for 121 toddlers 1.5-3y



Diary Page Example

Day 1 SATURDAY		Date 20-3-10		
Time	Where? With Whom? TV on? At table?	Food/Drink description & preparation	Brand Name	Portion size or quantity eaten
How to describe what your child had and how much can be found on pages 30-35 in Instruction Booklet				
6am to 9am				
7.45am	At home, in a highchair at the table. With Mum and Dad. TV on.	200ml bottled water 1 medium banana 4 tablespoons (measuring spoons) Rice Krispie multigrain shapes 1/2 scotch pancake with butter and jam	Tesco Fyffes Kellogs Morrisons	Drank 100mls water. Ate all of the banana and cereal. Didn't eat the scotch pancake.

Who are infants eating with? DNSIYC Dress rehearsal

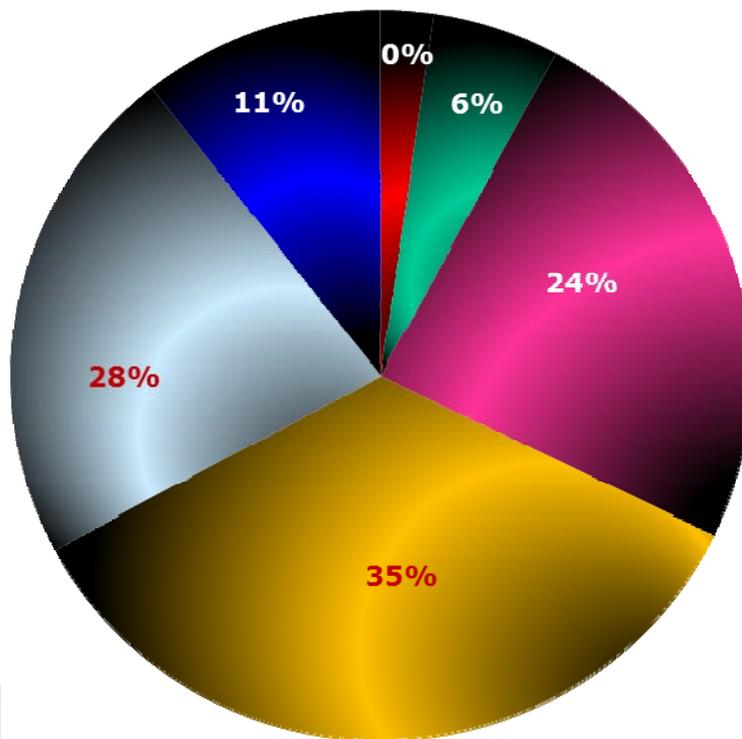


- Alone
- Family and friends
- Parents/Carers
- Siblings/other children
- Parents/Carers+ siblings/other children
- Others
- Not specified

% foods consumed with various others
15675 foods for 188 infants 4-18 months



Who are toddlers eating with? NDNS Y1

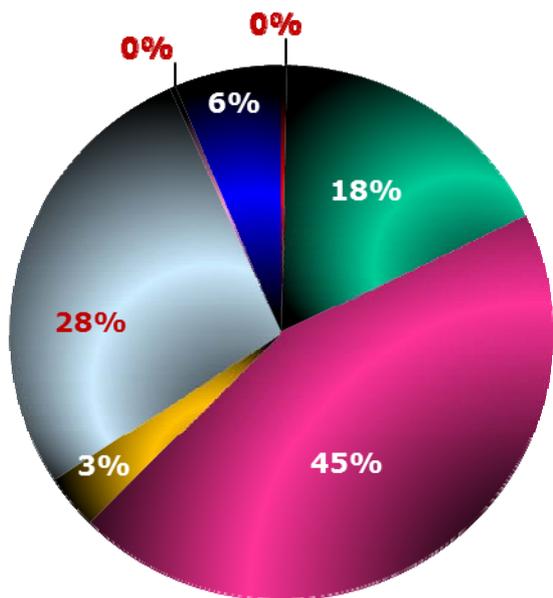


- Alone
- Family and friends
- Parents/Carers
- Siblings/other children
- Parents/Carers+ siblings/other children
- Not specified

% foods consumed with various others
7205 foods for 121 toddlers 1.5-3 years

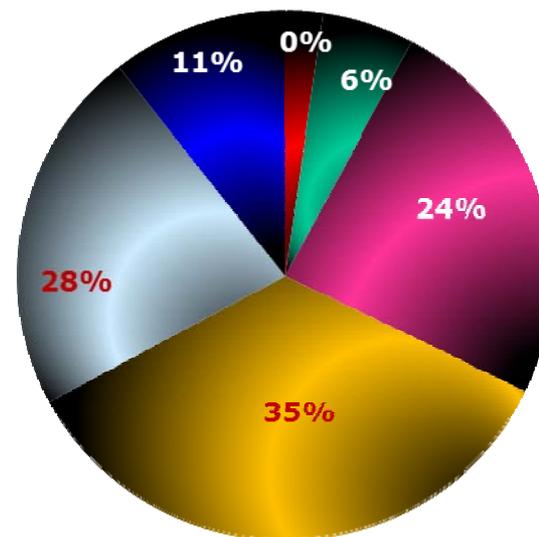


Who are toddlers eating with? DNSIYC vs NDNS Y1



15675 foods for 188 Infants 4-18 months

- Alone
- Family and friends
- Parents/Carers
- Siblings/other children
- Parents/Carers+siblings/other children
- Others
- Not specified



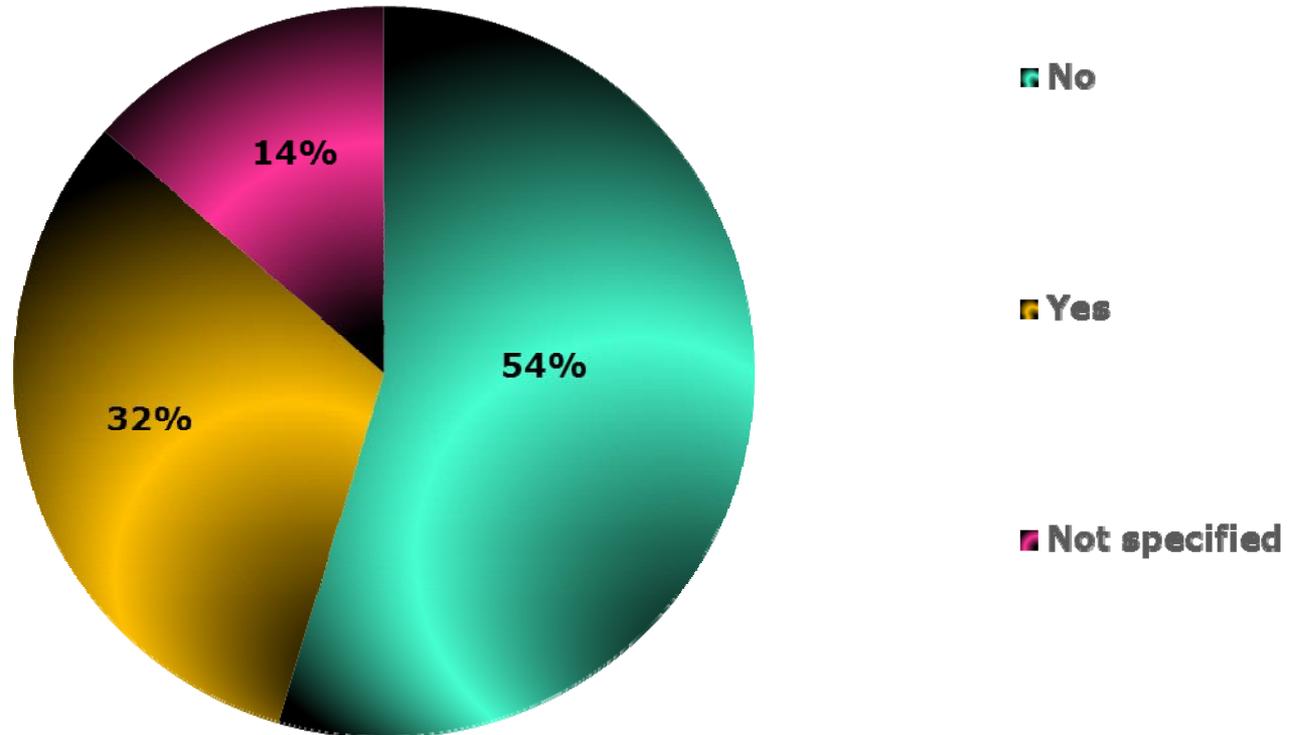
7205 foods for 121 toddlers 1.5-3 years

% foods consumed with various others

Diary Page Example

Day 1 SATURDAY		Date 20-3-10		
Time	Where? With Whom? TV on? At table?	Food/Drink description & preparation	Brand Name	Portion size or quantity eaten
How to describe what your child had and how much can be found on pages 30-35 in Instruction Booklet				
6am to 9am				
7.45am	At home, in a highchair at the table. With Mum and Dad. TV on.	200ml bottled water 1 medium banana 4 tablespoons (measuring spoons) Rice Knepie multigrain shapes 1/2 scotch pancake with butter and jam	Tesco Fyffes Kellogs Morrisons	Drank 100mls water. Ate all of the banana and cereal. Didn't eat the scotch pancake.

Eating with TV on DNSIYC dress rehearsal

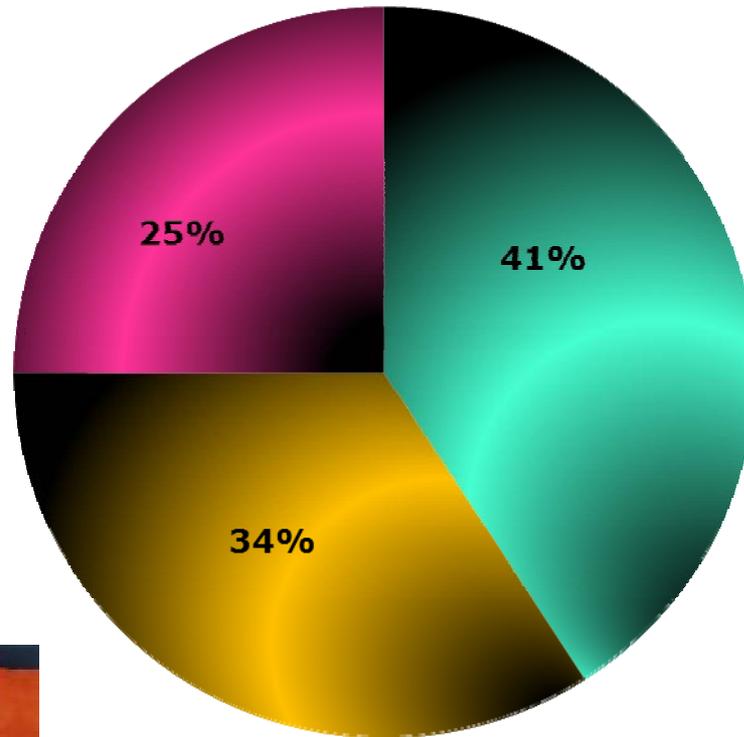


**% foods consumed with television on
15675 foods for 188 infants 4-18 months**



Grab your
voting
pads...

Eating with TV on NDNS Y1 1.5-3y



■ No

■ Yes

■ Not specified

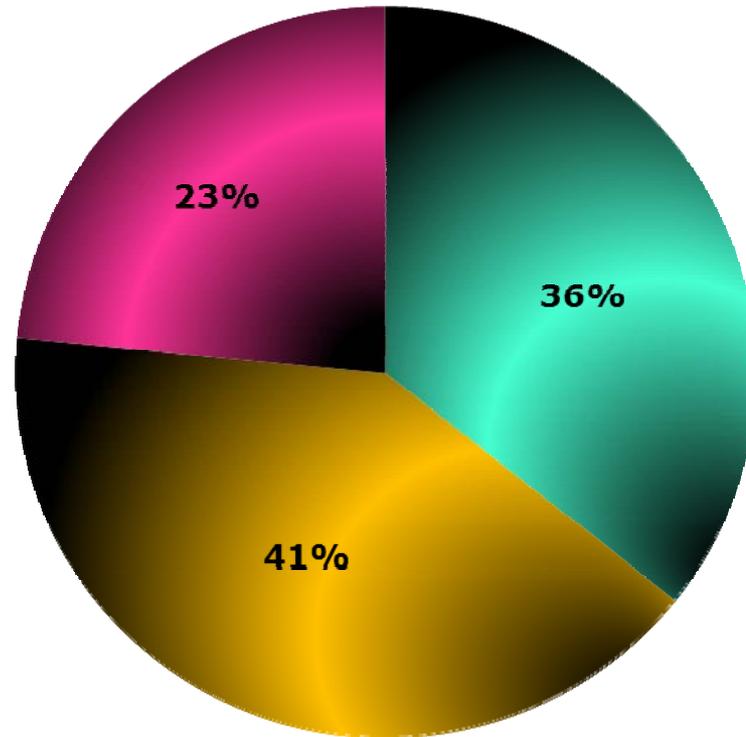


**% foods consumed with television on
7204 foods for 121 infants 1.5-3y**

Diary Page Example

Day 1 SATURDAY		Date 20-3-10		
Time	Where? With Whom? TV on? At table?	Food/Drink description & preparation	Brand Name	Portion size or quantity eaten
How to describe what your child had and how much can be found on pages 30-35 in Instruction Booklet				
6am to 9am				
7.45am	At home, in a highchair at the table. With Mum and Dad. TV on.	200ml bottled water 1 medium banana 4 tablespoons (measuring spoons) Rice Krispie multigrain shapes ½ scotch pancake with butter and jam	Tesco Fyffes Kellogs Morrisons	Drank 100mls water. Ate all of the banana and cereal. Didn't eat the scotch pancake.

Eating at the table DNSIYC dress rehearsal



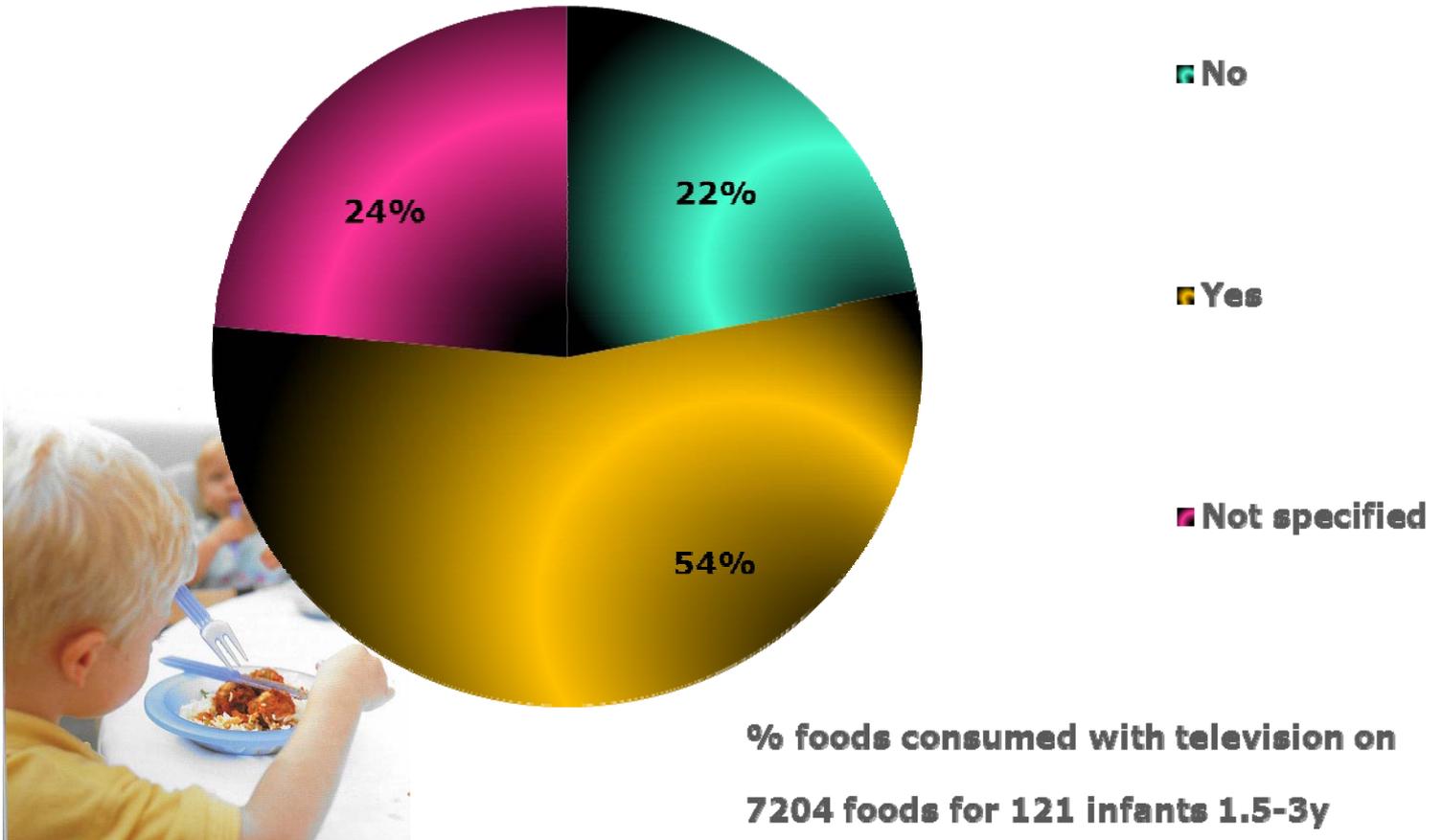
■ No

■ Yes

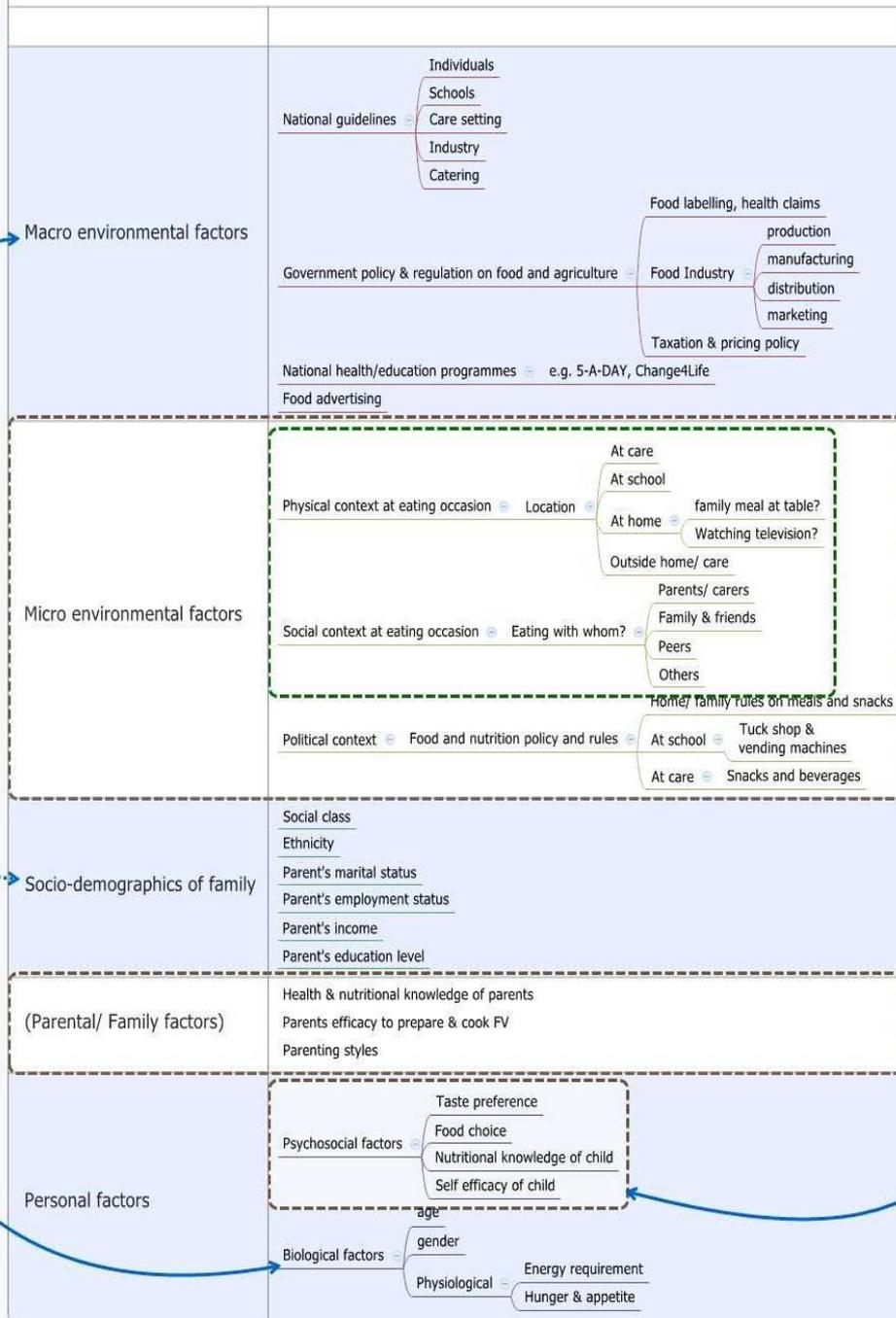
■ Not specified

**% foods consumed with television on
15675 foods for 188 infants 4-18 months**

Eating with TV on NDNS Y1 1.5-3y



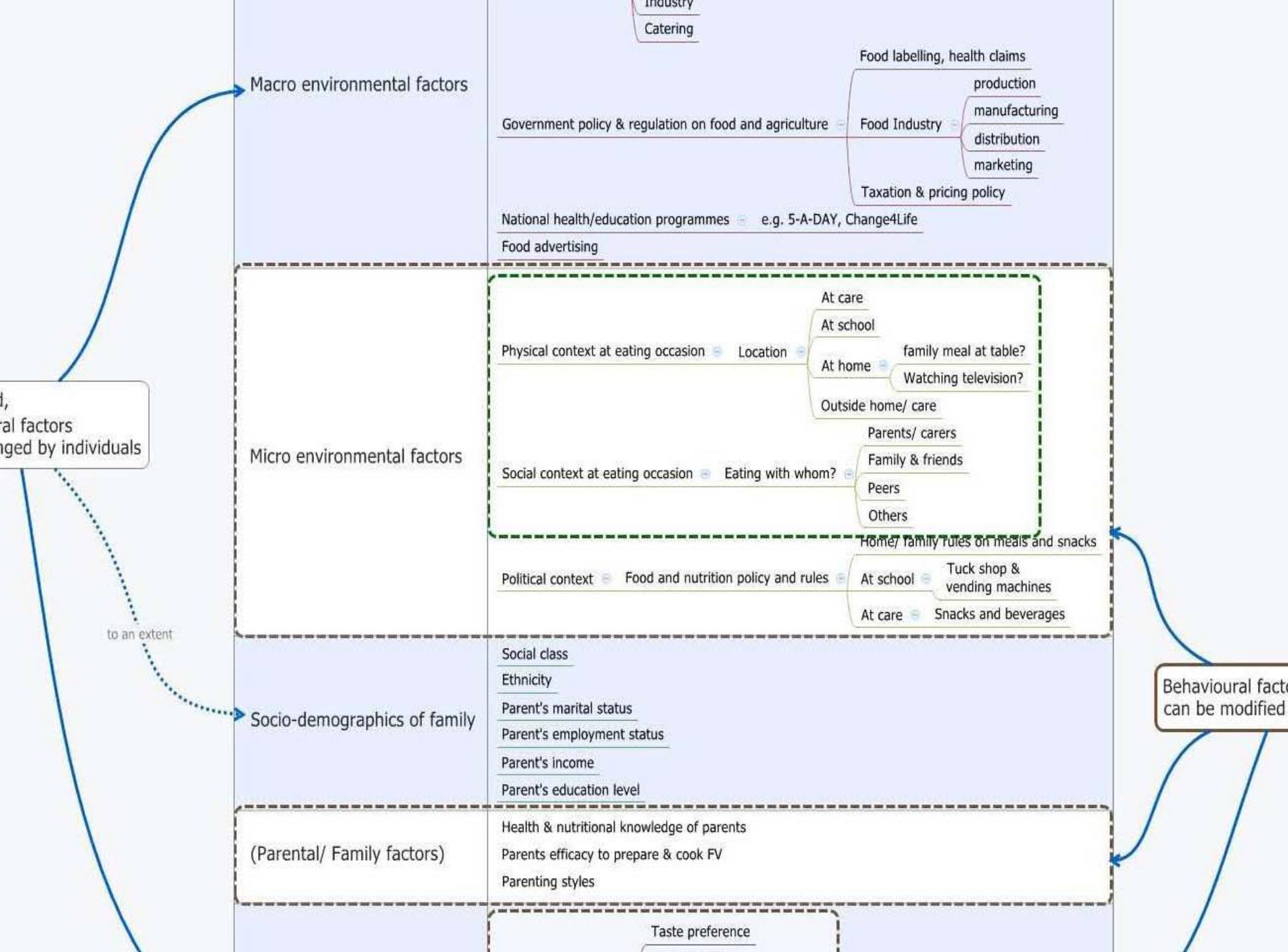
Determinants of fruit and vegetable consumption



Pre-determined, non-behavioural factors cannot be changed by individuals

to an extent

Behavioural factors can be modified by individuals



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