FUSSY EATING; DEVELOPMENT AND MANAGEMENT

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How do we successfully wean children on to a varied diet?

What is fussy eating?

No definitions available!

- Variable acceptance, eating more on one day than another; eating some foods one day but refusing them on another.
- Not taking in sufficient calories to maintain growth along expected centiles.

- Refusing new foods or foods that have been eaten before.
- Not accepting a range of foods that would be optimal in a ‘healthy’ diet.
- Rejecting foods of specific texture.

Fussy eating – limited range

Either a function of:-

- Late introduction to solid foods
- Limited introduction to solid foods
- Stage of child development
- Genetic predisposition to avoid new foods or difficult textures

All of these behaviours can be explained in terms of an interaction between:-

- learned acceptance of foods
- the neophobic stage
- child temperament
- parental strategy

Learned food acceptance

All the food that we like, we have learned to like.

Infants are given foods that are safe and culturally appropriate.

The more foods that are given in infancy the less fussy a child will be.

Developmental agenda for feeding

In utero

Some weak preferences learned for strong flavours.

Birth

Innate preference for a sweet taste
Preference for few tastes, learned from milk diet

4-6 months

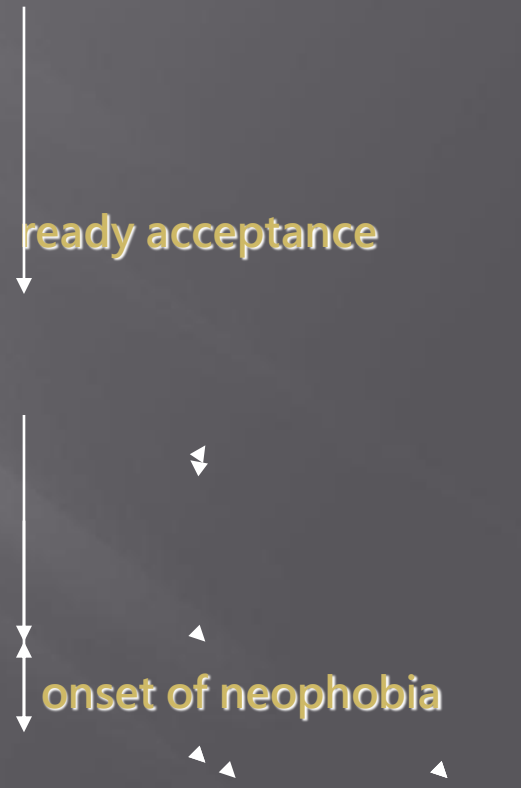
Window of acceptance for new tastes (solids)
Preference a function of exposure
Preference based on taste and smell

6-12 months

Sensitive period for the introduction of solid textures.

1– 2 years

Preference for food as a 'gestalt'
Food recognised by appearance.
Beginning of rejection of new foods, and some previously accepted foods



The acquisition of food preferences.

At birth there is a preference for a sweet taste,
(all other tastes are neutral or aversive - with the possible exception of Umami)

And there seems to be a preference for fat.

The neonate can clearly signal likes and dislikes.

Weaning on to solids 4-6 months

- You only need small amounts of food to induce a preference
- Few exposures are necessary
- Bitter tastes are more difficult
- Parents should be giving the foods they want their children to eat when they are older and are eating family meals.

Preference is entirely a function of exposure (Except for sweet taste preference)

Exposure in the 4-6 month period can give quite taste specific preferences.

Peter is 5 months old he was introduced to solid foods at 4 months old.
He accepts a mixture of fruit that he is used to having, but shows a disgust response to a new food – broccoli - which has a bitter taste.

New foods do not have to be given one by one, a generalised effect is found if many foods are introduced.

At weaning infants were exposed to:-
‘no variety’ vegetable,
‘variety with daily change’ ,
‘variety with change every three days’ ,
-for 9 days.

Frequency of change rather than number of vegetables predicted the acceptance of a new vegetable.
Maier et al (2008)

This generalised effect is long term.

In an analysis of data provided by parents from the ALSPAC data base, it was found that early fruit and vegetable consumption - prior to six months - predicted fruit and vegetable consumption at 7 years.

Parents were asked to record consumption of home-cooked, raw or ready prepared (baby food jar, tin or packet) fed to their infant by six months.

(Coulthard, Harris, Emmett, 2010.)

Frequency 7years	ready prep veg	ready prep fruit	home ckd veg	home ckd fruit	raw veg	raw veg
Salad	ns	ns	0.098	0.094	0.089	0.107
Tomatoes	ns	-0.045	0.097	0.111	0.054	0.109
Peas	-0.026*	ns	0.06	0.057	0.041	0.046
Sweetcorn	ns	ns	0.09	0.074	0.062	0.049
Carrots	ns	-0.028*	0.128	0.086	0.052	0.064
Other root veg.	ns	ns	0.089	0.054	0.044	0.024
Dk gr. leafy veg.	-0.025*	-0.043*	0.097	0.082	0.055	0.042
Other gr. veg.	-0.024*	-0.03*	0.088	0.056	0.055	0.032*
Citrus frts	ns	ns	0.083	0.052	0.085	0.075
Other frsh fruits	ns	-0.37*	0.128	0.127	0.087	0.119

Also

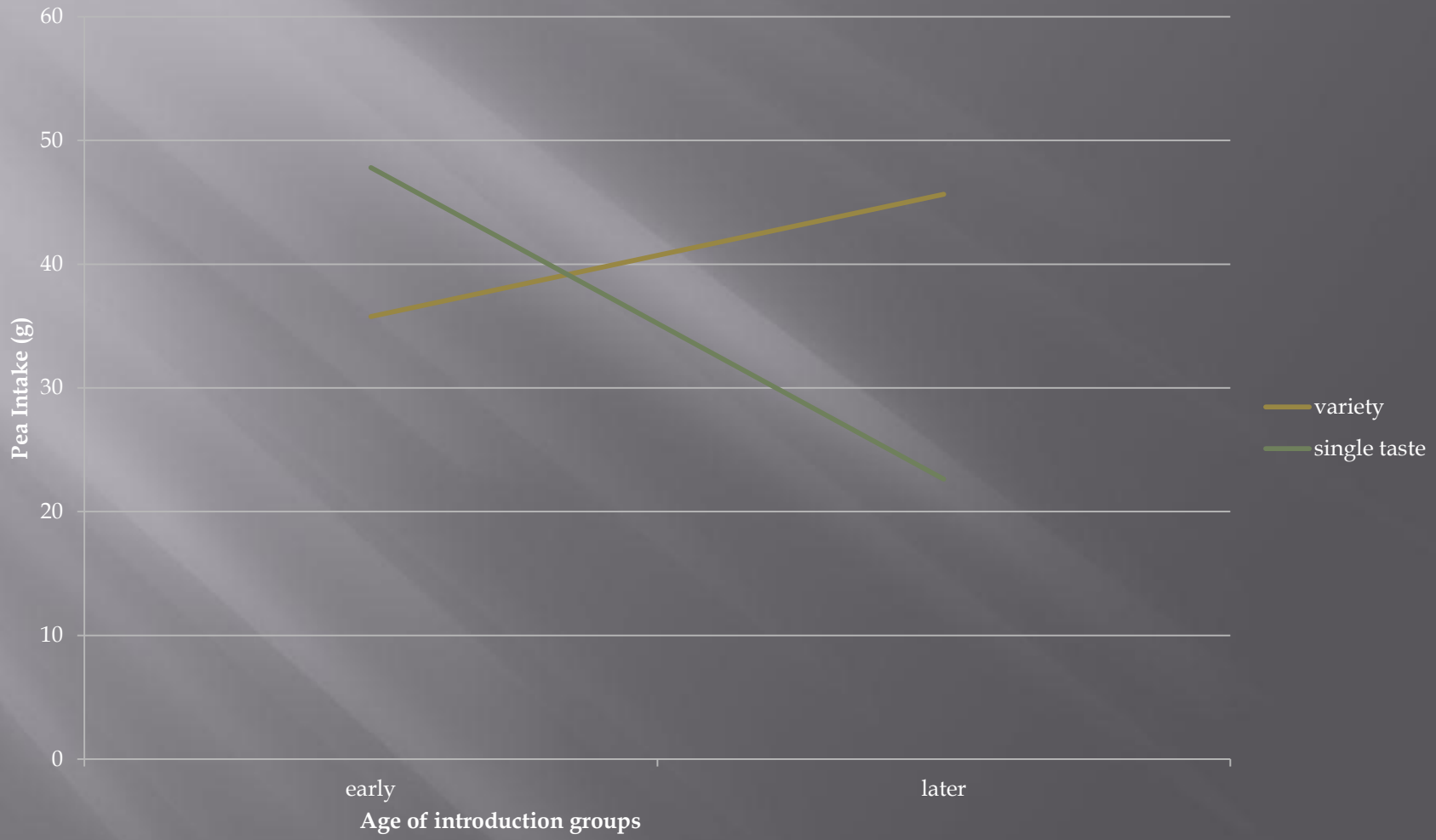
- Infants' acceptance of a new vegetable was also found to be dependent upon prior experience of vegetables and weaning age. (4 months or 6 months)

- Infants were tested for acceptance after experience of one, or three, new vegetables

- Limited prior experience, and 6 month age of weaning gave a lower acceptance.
  Coulthard & Harris (In preparation)

Intake of a new vegetable according to age of weaning and experience of variety of vegetables

Figure 1: Interaction between exposure group and age of introduction on pea consumption



Texture exposure 6 to 12 months-

- The tongue learns to move solid food around mouth in preparation for swallow.
- Infant learns to recognise food by sight.
- Infant needs to be exposed to tactile stimulation i.e. messy food/ messy play.
- Puree and bite and dissolve (yoghurt and crisps) are easier textures

Infants' chewing skills develop most markedly between the ages of 6 to 10 months, but only if the infant has experience of food in the mouth
Gisel (1991)

At this age oral motor skills may not be good enough to separate out lumps that are big enough to trigger the gag reflex, from those that can be swallowed using a liquid swallow.

Texture acceptance

The delayed introduction of lumpy solids can lead to problems of acceptance in later childhood.
Mason & Harris (2006)

Because:-

- the tongue and the sides of the mouth are not desensitized early,
- oral motor development is delayed,
- the onset of oral defensiveness, towards the end of the first year, precludes acceptance of different food textures.

Northstone et al (2001) looked at the effect of the timing of the introduction of lumpy solid foods on subsequent feeding difficulties.

Age of intro.	Feeding difficulties at 15 months.
<6mths	29.1%
6-9mths	38.6%
>10mths.	52.3%

We have looked to see whether this effect is still present in children of 7 years of age – using the ALSPAC data- base.

Children introduced to lumpy solids after the age of 9 months were reported as having more feeding problems at 7 years (food refusal and food ‘fussiness’).

(Coulthard, Harris, Emmett & Northstone, 2009)

The end of mere exposure 18 months –

the start of the neophobic response

When new foods,-
and some previously accepted foods-
will be rejected.

Foods are rejected on sight.

The neophobic stage.

Toddlers become increasingly reluctant to try new foods during the second year of life

We are interested to find out which strategies are successful in getting a toddler to try new foods during this stage.

Toddlers were more likely to try a new food in the neophobic period according to the age of weaning – earlier within the 4- 6 month period and the number of prompts by the mother.
Bennett & Blissett (In press)

Age at which solids were introduced	-0.86	0.28	-0.52	<.01
Family's annual income	-0.16	0.17	-0.15	.38
Length of mealtime	-0.02	0.04	-0.09	.64
Physical prompt	0.13	0.04	0.59	<.01

Toddlers at this age also stop eating foods that they used to eat.
Brown & Harris (2006)

During this process, infants become more aware of the 'local' details of food, and refuse to eat food that doesn't look 'right'.

Toddlers are more likely to refuse a food if it differs at subsequent presentations.

This stage also heralds the beginning of the disgust response and contamination fears.

Most of us have foods that we find disgusting.

These foods can act as contaminants to liked foods as early as 20 months

(Brown & Harris, 2012, Appetite)

Most children go through a period of food refusal during the neophobic stage of development.

When attempting any intervention, this stage needs to be taken into consideration.

Child temperament

Are some children more difficult than others about accepting foods?

Children differ according to their **innate characteristics** -
the degree to which they are **sensory sensitive & neophobic.**

Children who are more sensory sensitive eat fewer fruit and vegetables in the toddler period

Coulthard & Blissett (2009)

– this tendency continues throughout life.

The extent to which children and adults are willing to accept a new food (neophobia) differs along a continuum and continues through life

Children who are sensory sensitive and neophobic tend to be more anxious around food and of course more reluctant to take new foods.

Infants who are more sensory sensitive are more difficult to wean.

What works with getting a child to try new foods?

- *During the neophobic stage -*
  Modelling, exposure, prompting, reward to try.

- *If the child is fussy because of limited or late experience-*
  Modelling, exposure, possibly reward to try.

New food should be given on a separate plate in small portions.

What doesn't work

- Force feeding, coercion, restriction.
- Leaving long gaps between meals
- Putting disliked food on the plate next to liked food.
- Trying to 'hide' disliked foods

Avoidant/restrictive ED.

Innate disposition: -

- child shows extreme anxiety if offered new foods, or foods that they don’ t like.
- child may gag or vomit if offered disliked foods.
- usually boys.

- Energy intake must be the first priority.
- Dietary balance must take second place.

DO

✓Give only the foods that they will eat.
✓Give short, but frequent eating opportunities.
✓Encourage and promote messy play.
✓Help the child to generalise their food choices.

Look for other problems that might be worrying the parent - this type of food refusal occurs more frequently in children who are on the autistic spectrum