

A New Resource: 'Practical Portions for Prader-Willi Syndrome'

Evelien Gevers

Consultant and Honorary Reader in Paediatric Endocrinology

Dept of Paed Endocrinology, Barts Health NHS Trust – Royal London, London, UK

William Harvey Research Institute, Queen Mary University of London, London, UK



Evelien.gevers@nhs.net



Barts Health NHS Trust

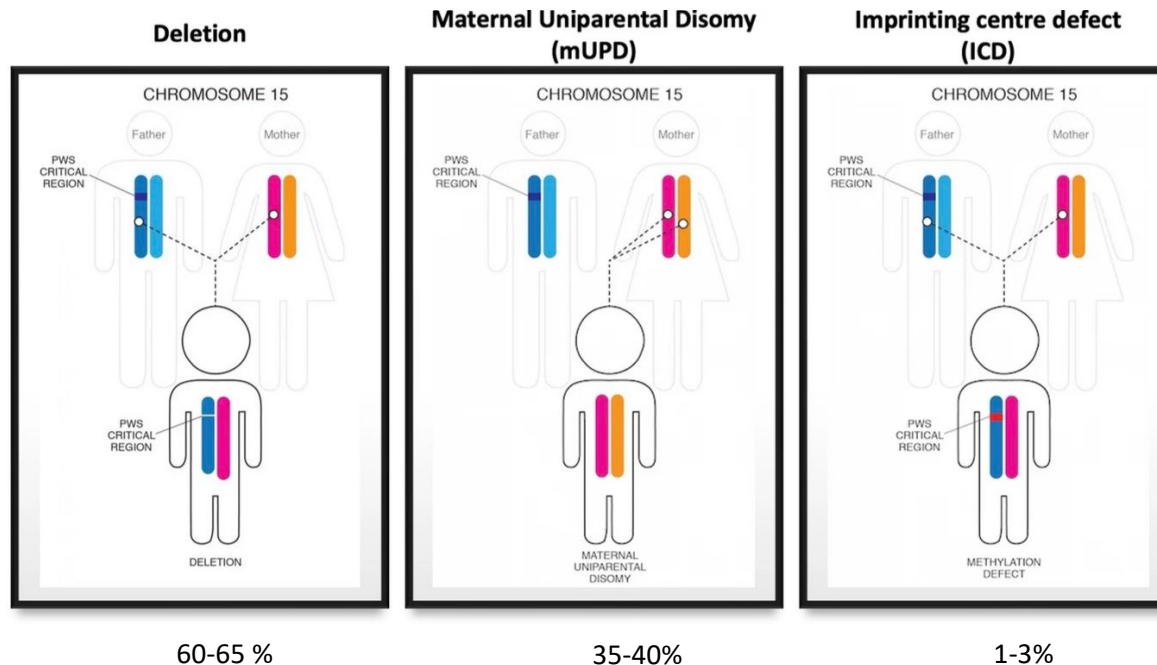
William Harvey Research Institute



Background

1 out of every
15,000 births

- Hypotonia
- Low muscle mass
- **Feeding difficulties**
- **Faltering growth**
- Developmental and cognitive delay
- Behavioural problems
- Sleep disorders
- Neuroendocrine abnormalities
- **Hyperphagia**



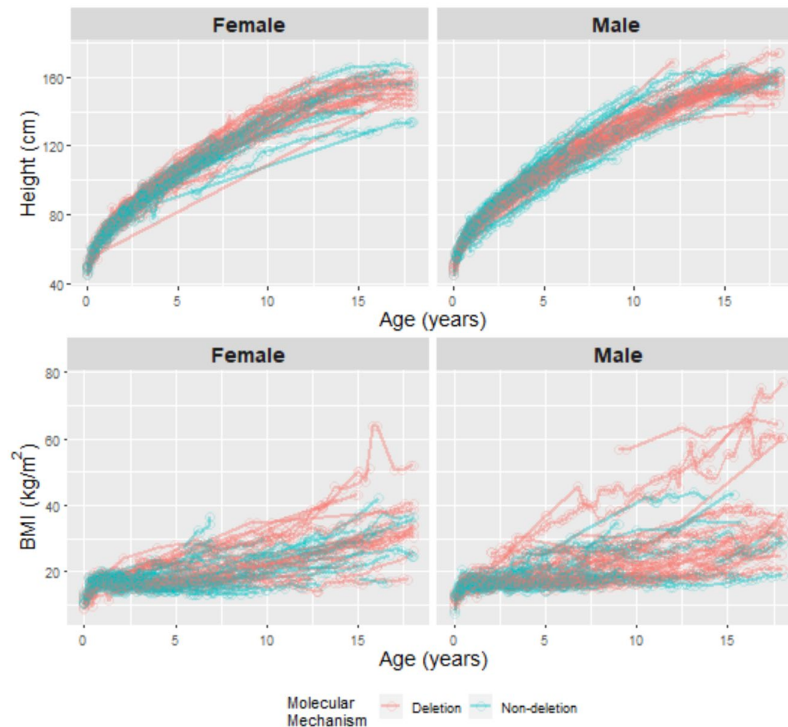
Genotype – Phenotype relation

- mUPD:**

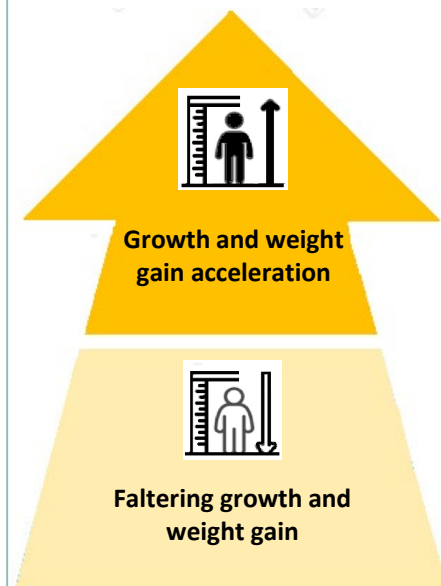
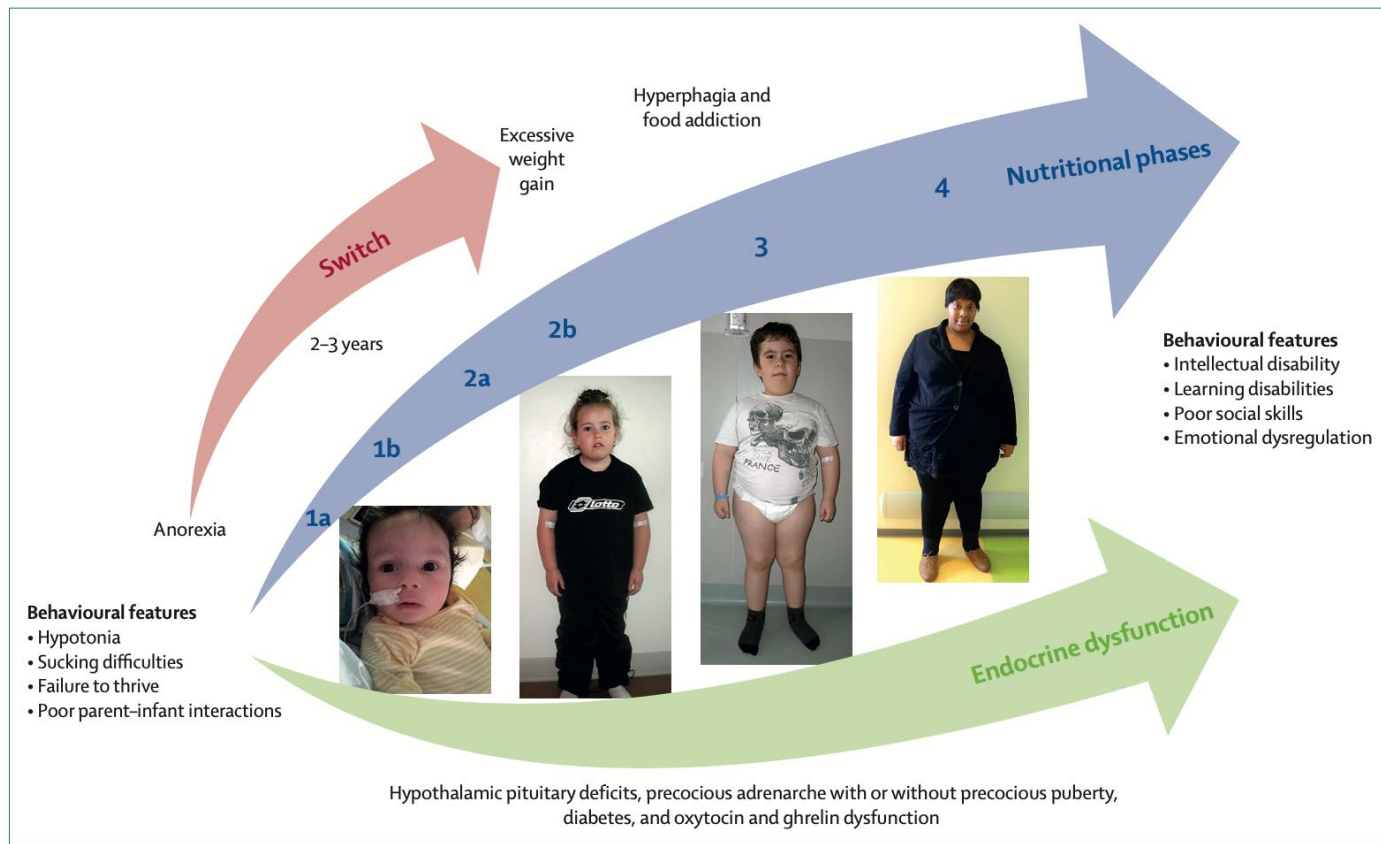
- Higher maternal age (31.4 ± 3.4 vs 27.8 ± 3.8 years), **more anxiety (64.29% vs 26.09%)** and **autistic traits (57.14% vs 26.09%)**, and less hypopigmentation (42.11% vs 68.24%) and skin picking (42.86% vs 71.01%) than the deletion group. **More change of psychosis.**

- Type I deletion:**

- Diagnosed at earlier age (3.7 ± 3.3 vs 6.2 ± 3.2 years) and **more common speech delay (95.45% vs 63.83%)** than type II. **Slightly higher BMI than mUPD.**



Natural progression



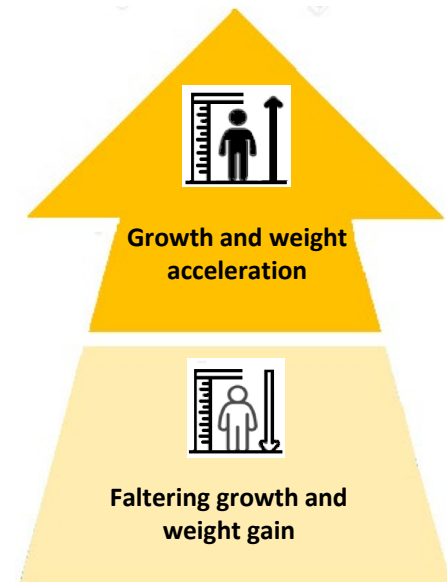
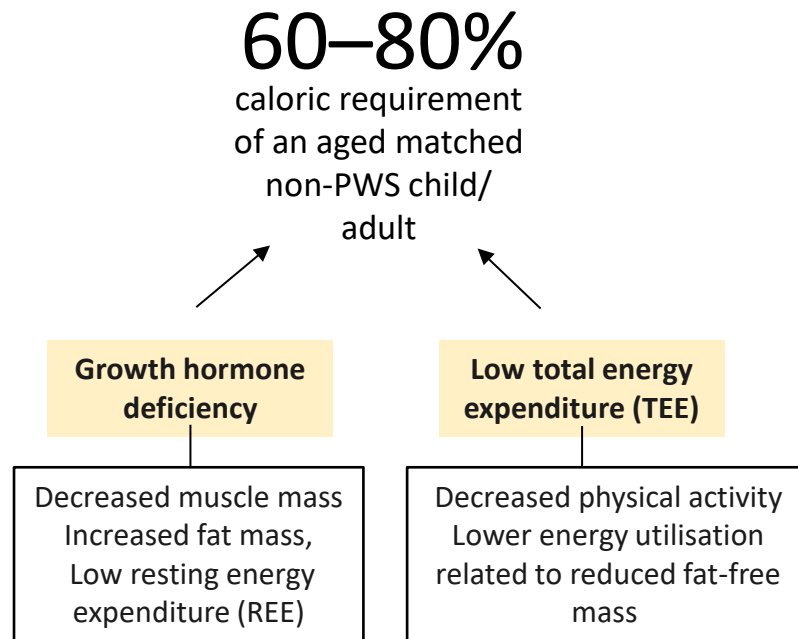
Nutritional phases

- **Phase 0:** intrauterine growth is restricted.
- **Phase 1** (at birth): the infant is hypotonic
 - subphase **1a: difficulty feeding with failure to thrive** (aged 0–9 months)
 - subphase **1b: grows steadily along a growth curve** and weight increases at a normal rate (9 mo-2 years).
- **Phase 2: excessive weight gain**
 - subphase **2a** (aged 2–4 years): **without a substantial change in appetite** or caloric intake
 - Subphase **2b** (aged 4-6 years): **with a concomitant increased interest** in food.
- **Phase 3: marked hyperphagia**, typically accompanied by food seeking and insatiable appetite
- [**Phase 4** (in some adults): no longer insatiable appetite and ability to feel full]



1 out of every 15,000 births

- Hypotonia
- **Feeding difficulties**
- **Faltering growth**
- Developmental and cognitive delay
- Behavioural problems
- Sleep disorders
- Neuroendocrine abnormalities
- **Hyperphagia**



Prader-Willi syndrome: guidance for children and transition into adulthood.

Shaikh MG, Barrett TG, Bridges N, Chung R, Gevers EF, Goldstone AP, Holland A, Kanumakala S, Krone R, Kyriakou A, Livesey EA, Lucas-Herald AK, Meade C, Passmore S, Roche E, Smith C, Soni S.

Endocr Connect. 2024 Jul 10;13

Diet and weight management

- Aim to prevent obesity rather than reduce obesity
- Provide safe food environment
- Three pillars: Growth hormone, healthy diet, exercise.
- Recognise the reduced energy requirement from approx. age 2





Challenges
caring for
people with PWS



Variable access to clinical support



Challenges
caring for
people with PWS

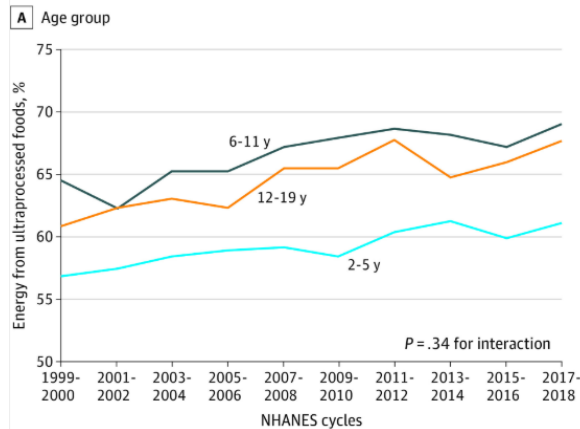


Variable access to clinical support



Trends in Consumption of Ultra processed Foods Among US Youths Aged 2-19 Years, 1999-2018.
Wang L, Martínez Steele E, Du M, et al.
JAMA. 2021;326(6):519-530

Increased availability, promotion and advertising of UltraProcessed Foods (UPF)



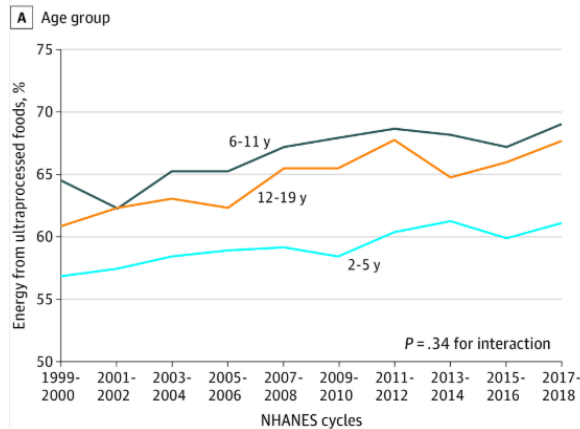
Challenges
caring for
people with PWS

Variable access to clinical support



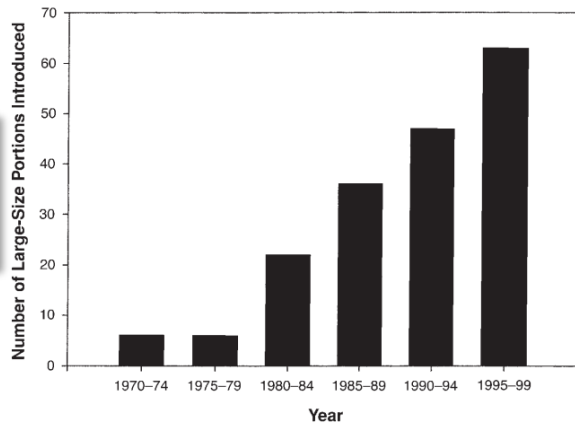
Trends in Consumption of Ultra processed Foods Among US Youths Aged 2-19 Years, 1999-2018.
Wang L, Martínez Steele E, Du M, et al.
JAMA. 2021;326(6):519-530

Increased availability, promotion and advertising of UltraProcessed Foods (UPF)



Challenges caring for people with PWS

Societal increases in portions



The contribution of expanding portion sizes to the US obesity epidemic.
Young LR, Nestle M.
Am J Public Health. 2002 Feb;92(2): 246-9.

FIGURE 2—Introduction of new, larger portions, 1970–1999.

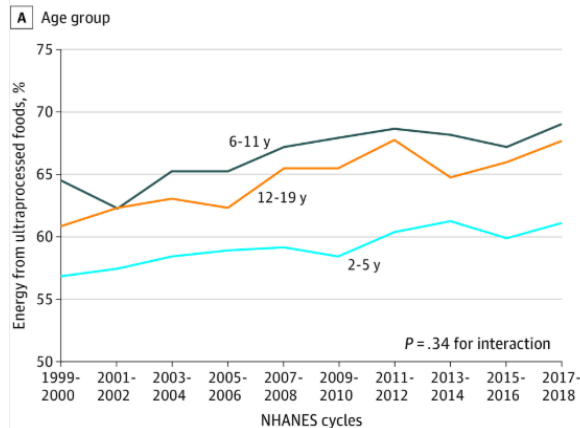


Variable access to clinical support



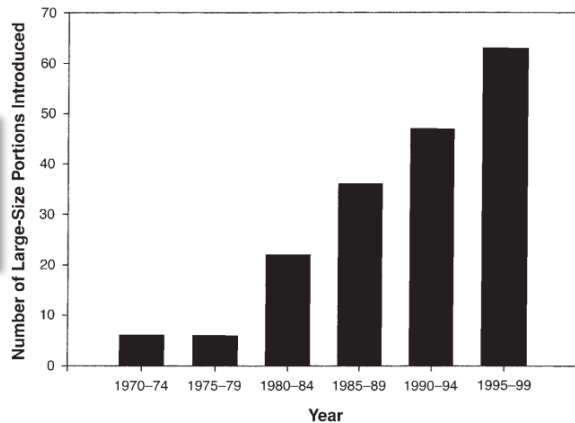
Trends in Consumption of Ultra processed Foods Among US Youths Aged 2-19 Years, 1999-2018.
Wang L, Martínez Steele E, Du M, et al.
JAMA. 2021;326(6):519-530

Increased availability, promotion and advertising of UltraProcessed Foods (UPF)



Challenges caring for people with PWS

Societal increases in portions



The contribution of expanding portion sizes to the US obesity epidemic.
Young LR, Nestle M.
Am J Public Health. 2002 Feb;92(2): 246-9.

FIGURE 2—Introduction of new, larger portions, 1970–1999.

Balance

LOW
CALORIE
REQUIREMENT

60–80%
of non PWS
person

Excess
calories

Micronutrient
deficiencies

NORMAL
NUTRIENT
REQUIREMENT

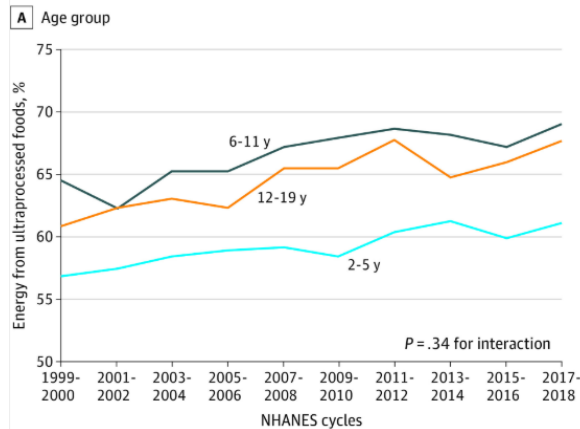
Same as general
population

Variable access to clinical support



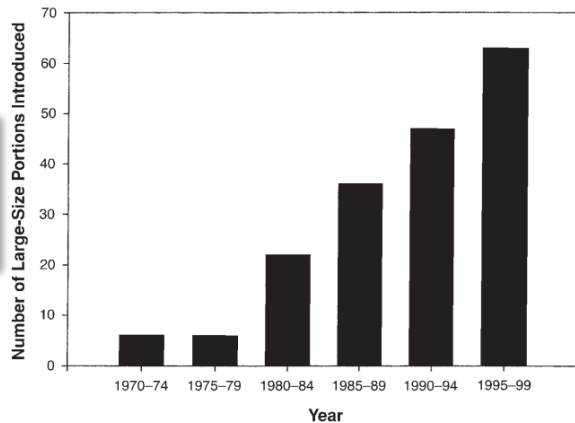
Trends in Consumption of Ultra processed Foods Among US Youths Aged 2-19 Years, 1999-2018.
Wang L, Martínez Steele E, Du M, et al.
JAMA. 2021;326(6):519-530

Increased availability, promotion and advertising of UPF



Challenges caring for people with PWS

Societal increases in portions



The contribution of expanding portion sizes to the US obesity epidemic.
Young LR, Nestle M.
Am J Public Health. 2002 Feb;92(2): 246-9.

FIGURE 2—Introduction of new, larger portions, 1970–1999.

Balance

LOW CALORIE REQUIREMENT

60–80% of non PWS person

Excess calories

Micronutrient deficiencies

NORMAL NUTRIENT REQUIREMENT

Same as general population

HOME



SCHOOL



FRIENDS



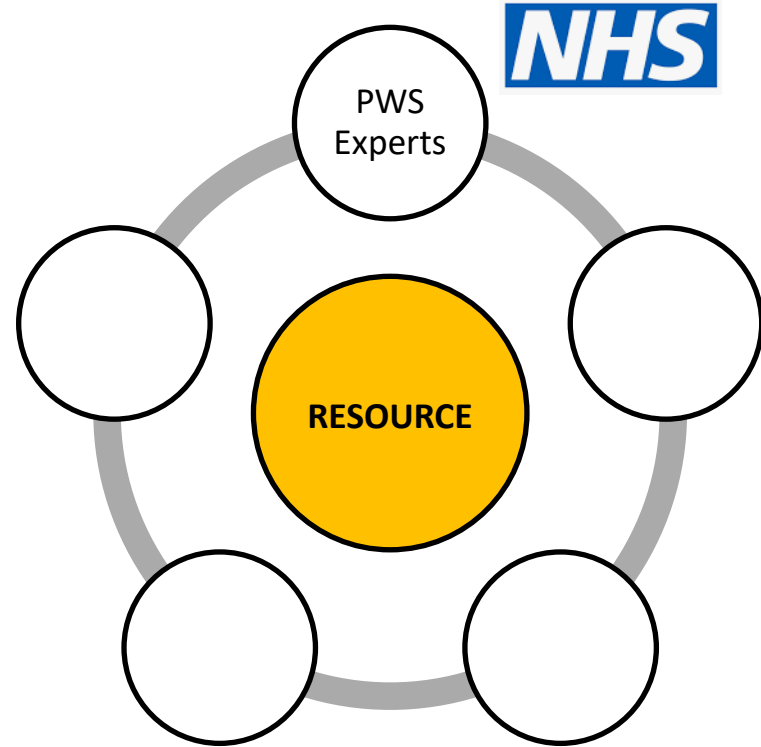
1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

- 1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.
- 2) To assess the nutritional adequacy of these proposed intakes.

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

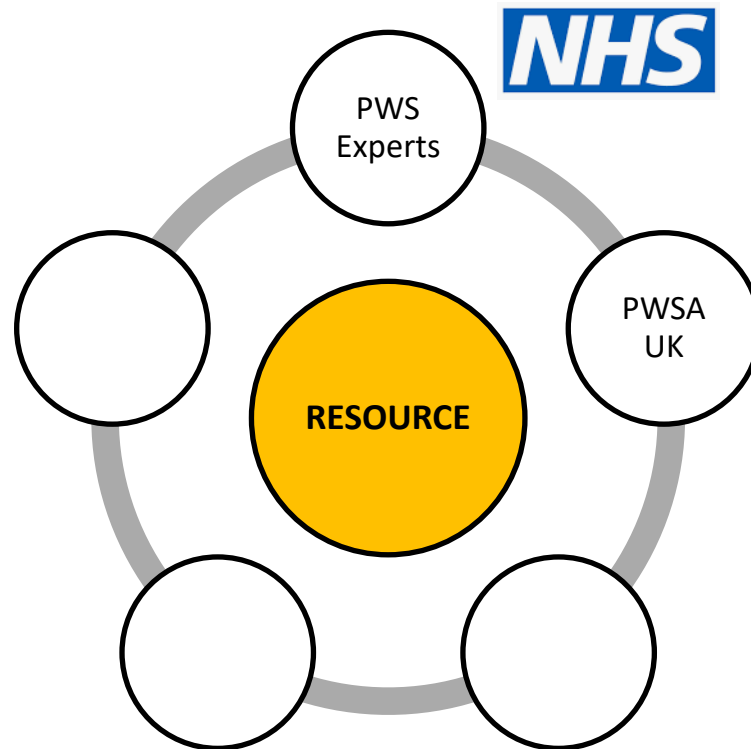
Methods



METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



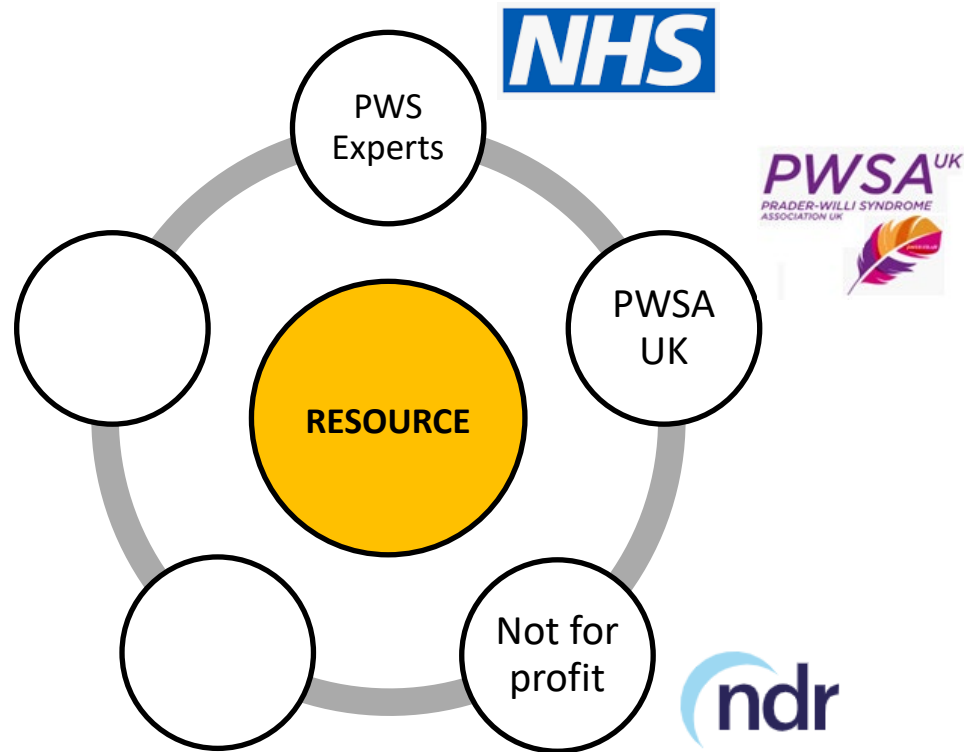
NHS

PWSA^{UK}
PRADER-WILLI SYNDROME
ASSOCIATION UK

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

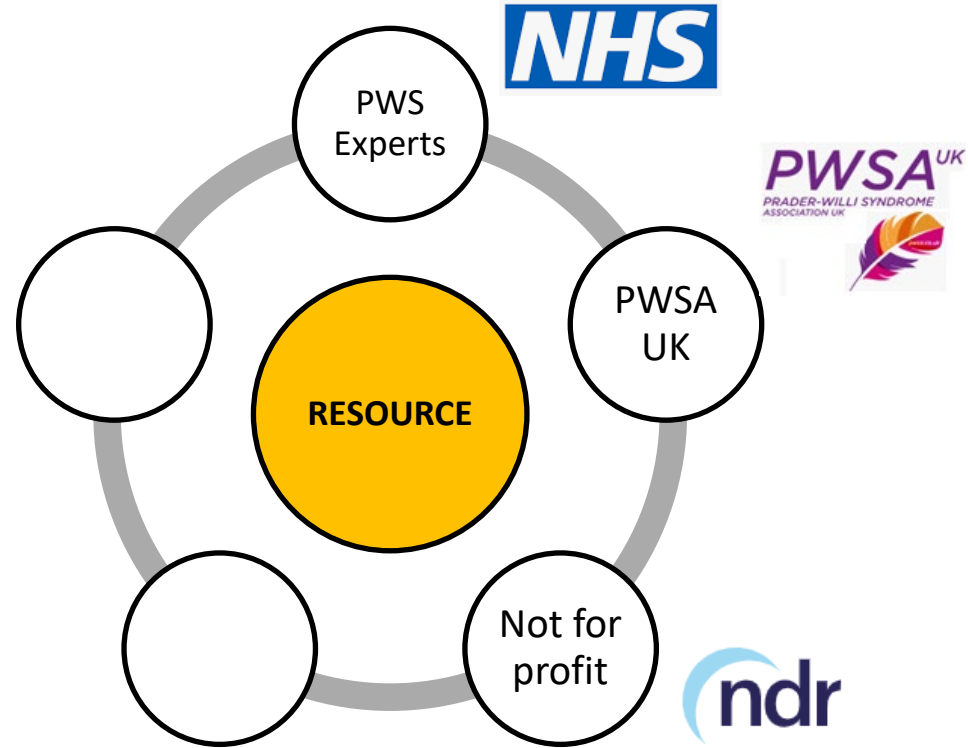
2) To assess the nutritional adequacy of these proposed intakes.



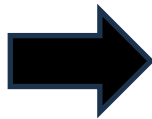
METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



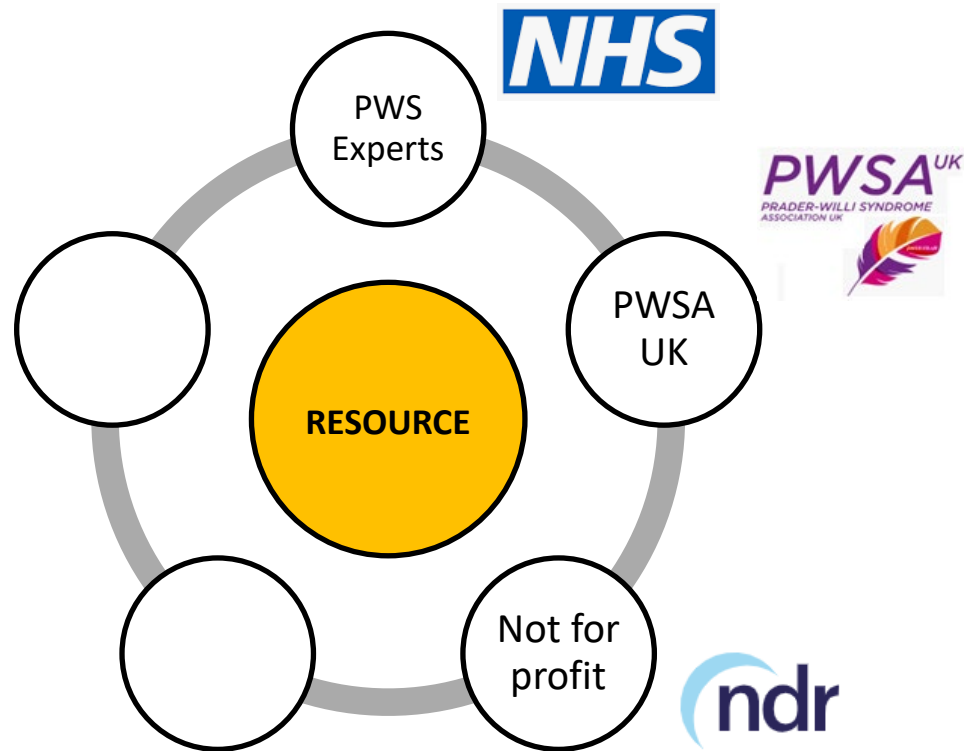
Used previously defined national portion sizes for children (Public Health England, 2016)



METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



Used previously defined national portion sizes for children (Public Health England, 2016)

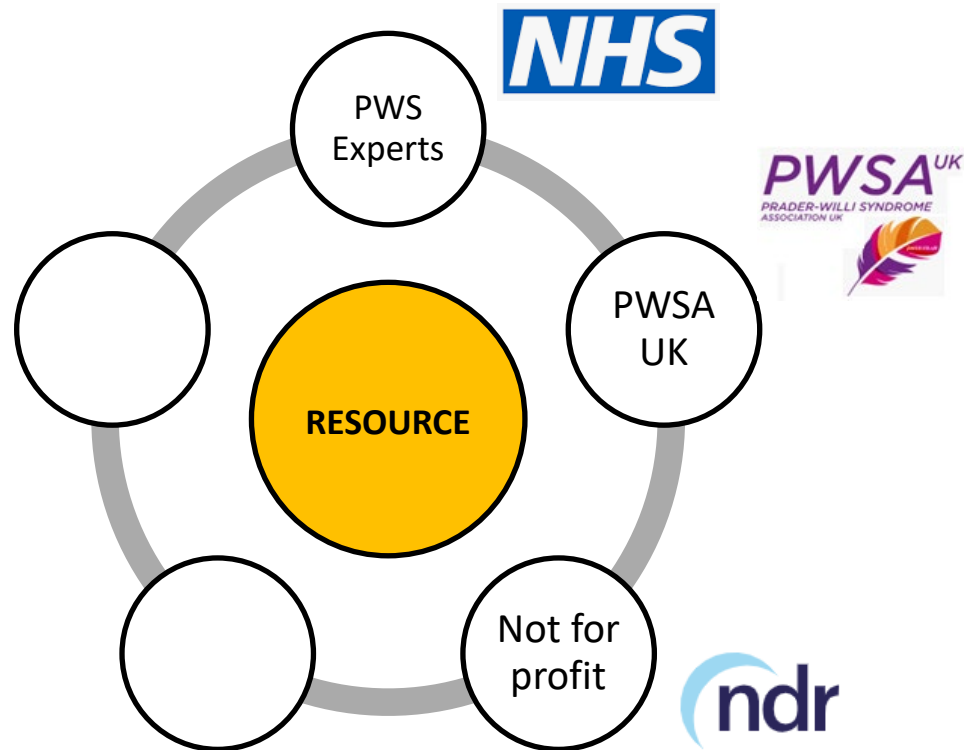


Proportionally reduced by 30%

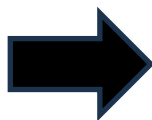
METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

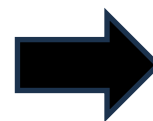
2) To assess the nutritional adequacy of these proposed intakes.



Used previously defined national portion sizes for children (Public Health England, 2016)



Proportionally reduced by 30%



2-3years

11-13years

4-6years

14-18years

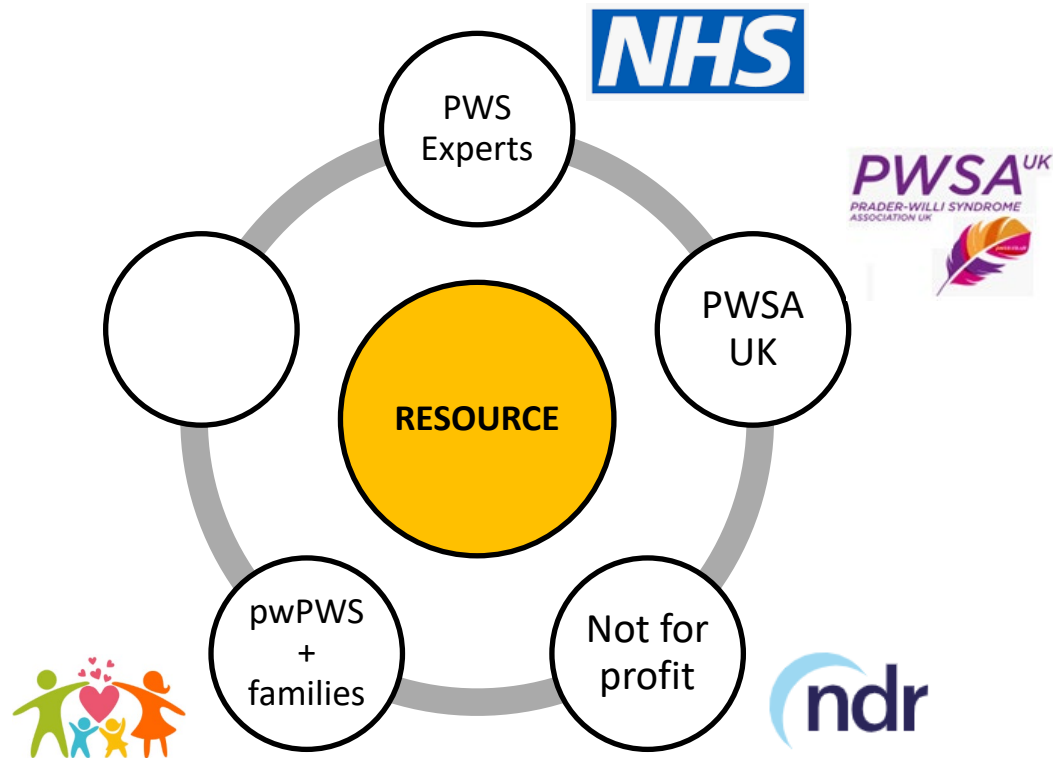
7-10years

19-64years

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

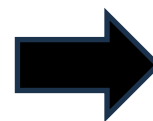
2) To assess the nutritional adequacy of these proposed intakes.



Used previously defined national portion sizes for children (Public Health England, 2016)



Proportionally reduced by 30%



2-3years

11-13years

4-6years

14-18years

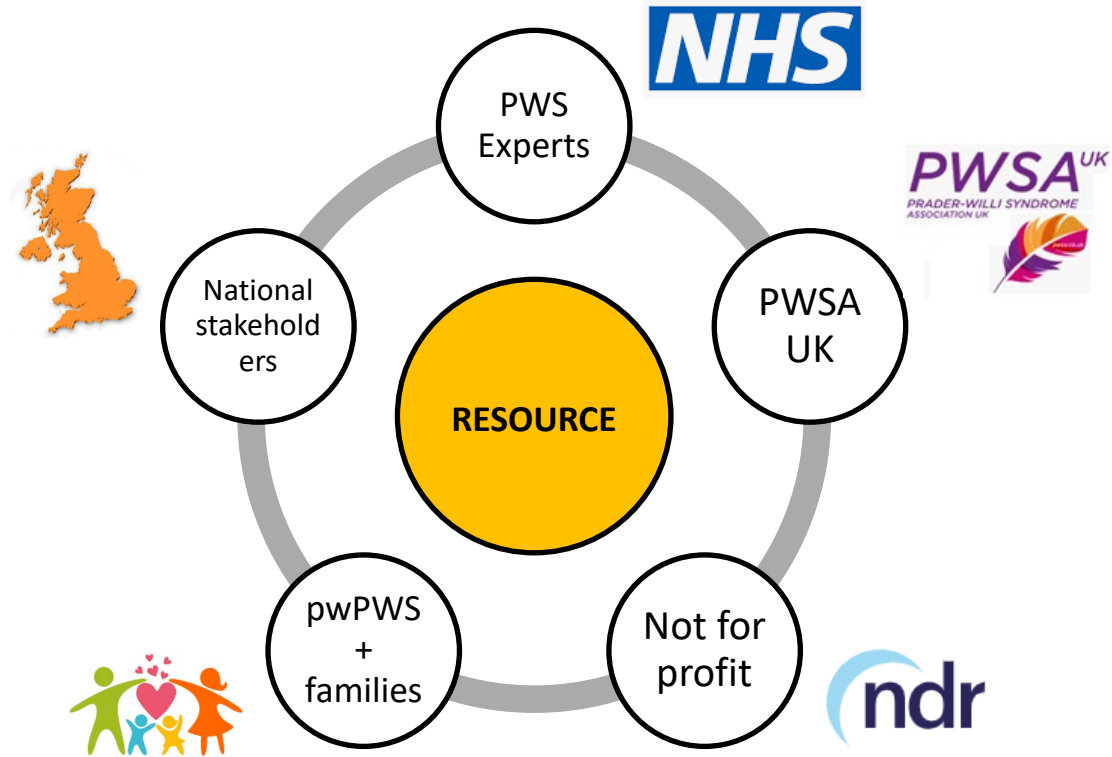
7-10years

19-64years

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

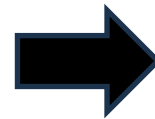
2) To assess the nutritional adequacy of these proposed intakes.



Used previously defined national portion sizes for children (Public Health England, 2016)



Proportionally reduced by 30%



2-3years

11-13years

4-6years

14-18years

7-10years

19-64years



METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



Resource used to produce a sample 24hour meal plan

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.



Resource used to produce a sample 24hour meal plan



2) To assess the nutritional adequacy of these proposed intakes.



Applied the defined portion sizes for age

2-3years

11-13years

4-6years

14-18years

7-10years

19-64years

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



Resource used to produce a sample 24hour meal plan



Applied the defined portion sizes for age

2-3years

11-13years

4-6years

14-18years

7-10years

19-64years



Analysed the diet

METHOD

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



Resource used to produce a sample
24hour meal plan



Applied the defined portion sizes for age

2-3years

11-13years

4-6years

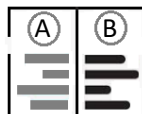
14-18years

7-10years

19-64years



Analysed the diet

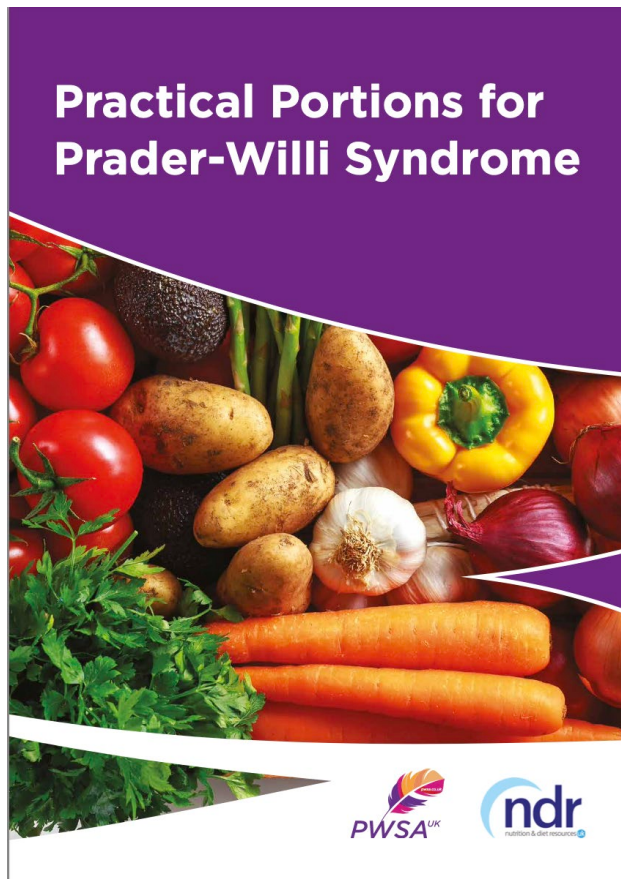


- Compared calories provided to PWS target (60-80%)
- Compared micronutrients provided to national target for micronutrients (Reference Nutrient Intakes – **RNI**)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

'Practical Portions for Prader Willi Syndrome'



- Aimed for use by carers and adult patients with supervision
- Photographs of 60 foods for 6 age categories
- Includes undesired foods, but labelled with a red dot
- Freely available on line and printed from PWSA-UK



1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

'Practical Portions for Prader Willi Syndrome'

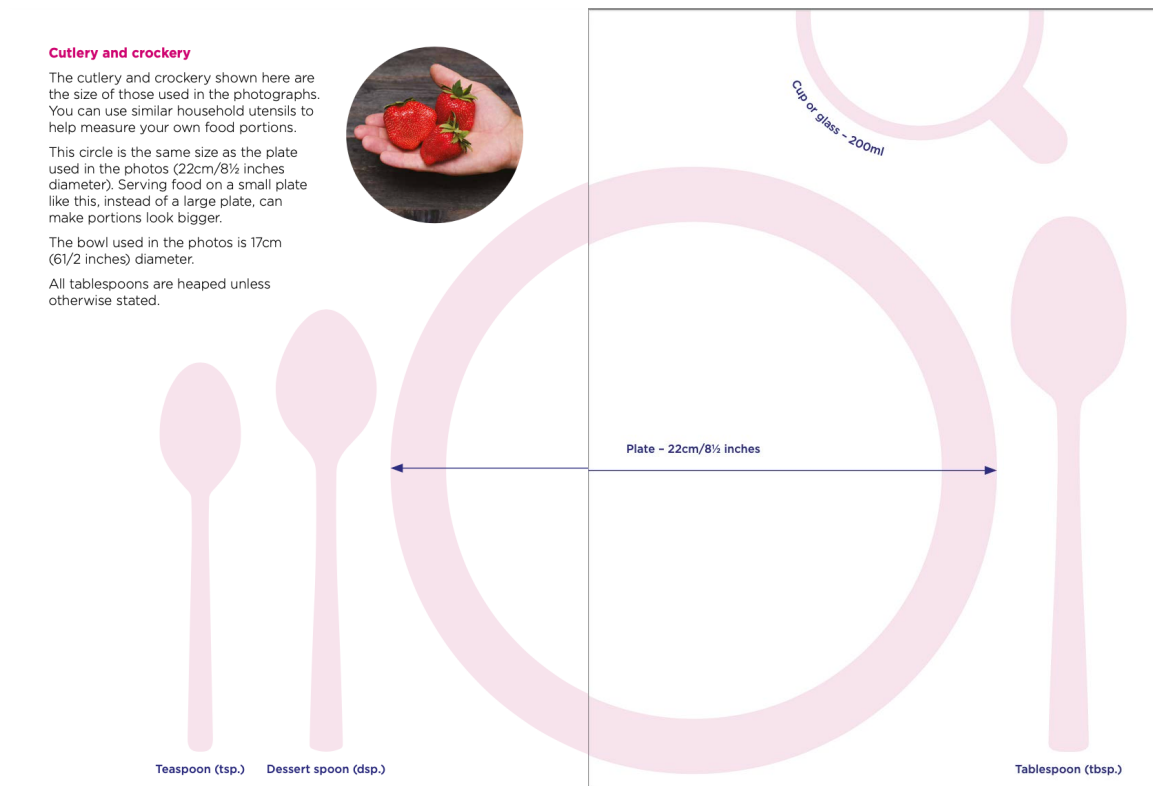
Cutlery and crockery

The cutlery and crockery shown here are the size of those used in the photographs. You can use similar household utensils to help measure your own food portions.

This circle is the same size as the plate used in the photos (22cm/8½ inches diameter). Serving food on a small plate like this, instead of a large plate, can make portions look bigger.

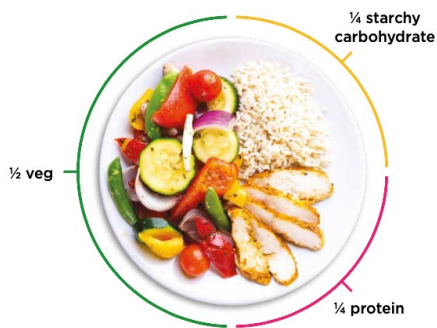
The bowl used in the photos is 17cm (6½ inches) diameter.

All tablespoons are heaped unless otherwise stated.

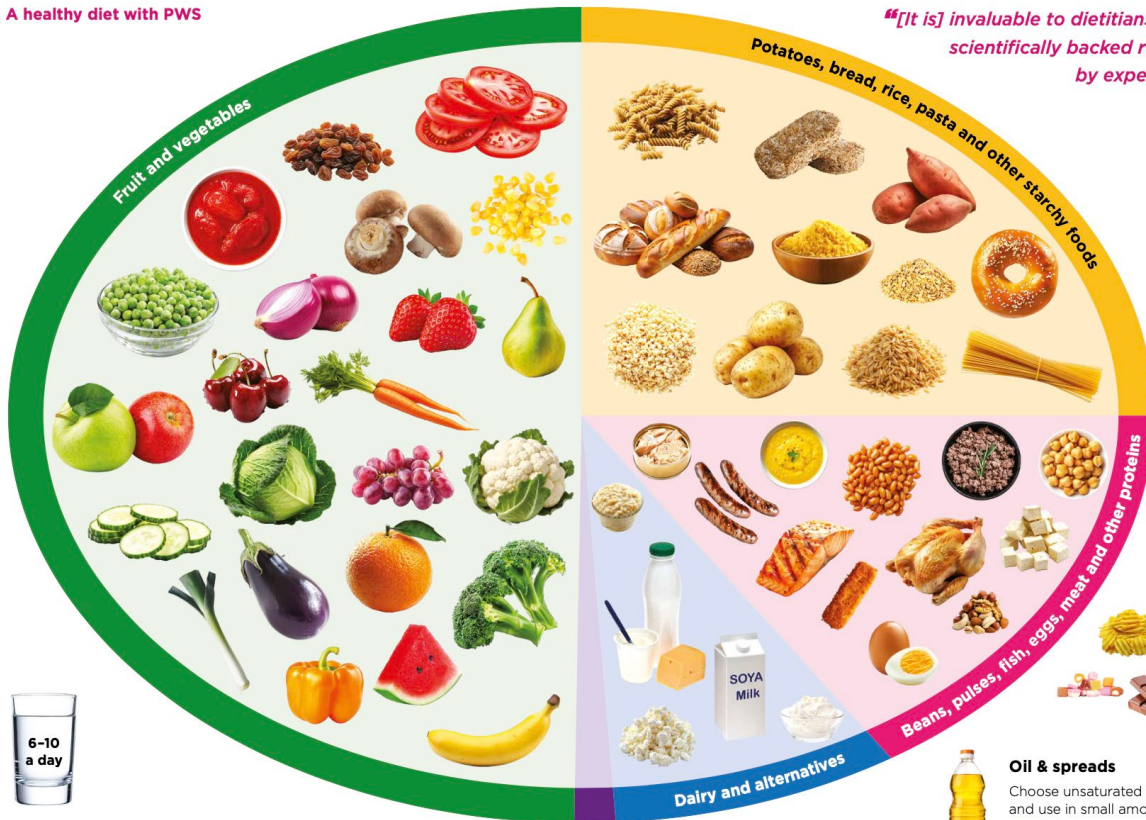


1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.



A healthy diet with PWS



"[It is] invaluable to dietitians to have a clear scientifically backed resource created by experts in the field."

Dietitian



Water, lower fat milk, sugar-free drinks including tea and coffee all count.

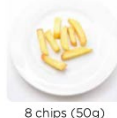
These foods are best avoided.

Choose unsaturated oils and use in small amounts.

'Practical Portions for Prader Willi Syndrome'

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

		7-10 years	11-13 years	14-18 years	19-64 years	
Potatoes						
	1 egg-sized (60g)	1½ egg-sized (90g)	1½ egg-sized (90g)	2 egg-sized (120g)	2½ egg-sized (150g)	2½ egg-sized (150g)
Sweet potatoes						
	½ egg-sized (30g)	1 egg-sized (60g)	1½ egg-sized (90g)	1½ egg-sized (90g)	2 egg-sized (120g)	2 egg-sized (120g)
Oven chips, baked						
	3 chips (20g)	5 chips (30g)	6 chips (35g)	7 chips (45g)	9 chips (60g)	8 chips (50g)

We have included wholegrain/brown versions of pasta, bread and rice as these are recommended.

Potatoes, bread, rice, pasta and other starchy foods (6-8 portions per day)

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
White fish, oven cooked (cod, haddock, plaice)						
	1/4 fillet (30g)	1/4 fillet (90g)	1/4 fillet (90g)	1 fillet (120g)	1 1/4 fillet (150g)	1 fillet (120g)
Tuna, tinned in brine or spring water						
	1 tbsp (35g)	2 tbsp (70g)	2 1/2 tbsp (85g)	3 tbsp (100g)	4 tbsp (130g)	3 1/2 tbsp (115g)
Sliced roast beef						
	1 slice (25g)	2 slices (50g)	3 slices (75g)	3 slices (75g)	4 slices (100g)	4 slices (100g)
Chicken nuggets, oven cooked ●						
	1 nugget (15g)	2 1/2 nuggets (30g)	3 nuggets (40g)	4 nuggets (50g)	5 nuggets (60g)	4 nuggets (50g)

Beans, pulses, fish, eggs, meat and other proteins (2-3 portions per day)



'These foods are best avoided as they are unhealthy'



1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

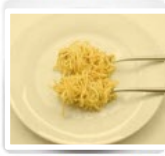
1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

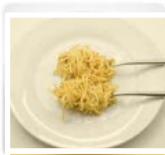
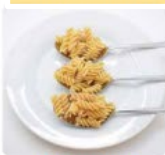
1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Couscous, cooked	 ½ tbsp. (15g)	 1 tbsp. (30g)	 1½ tbsp. (45g)	 1½ tbsp. (45g)	 2 tbsp. (60g)	 1½ tbsp. (45g)
Quinoa, cooked	 1½ tbsp. (35g)	 2 tbsp. (50g)	 2½ tbsp. (65g)	 3 tbsp. (75g)	 3½ tbsp. (90g)	 3½ tbsp. (90g)
Egg noodles, cooked	 ½-1 forkful (20g)	 1 forkful (30g)	 1½ forkful (45g)	 2 forkfuls (60g)	 2 forkfuls (60g)	 2 forkfuls (60g)
Wholewheat pasta, cooked	 1½ tbsp. (30g)	 2 tbsp. (40g)	 2½ tbsp. (50g)	 3 tbsp. (60g)	 4 tbsp. (80g)	 3½ tbsp. (70g)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
Peppers	 1/4 pepper	 1/2 pepper	 1/2 pepper	 1/2 pepper	 1/2 pepper	 1/2 pepper
Sweetcorn or peas	 1 1/2 heaped tbsps.	 3 heaped tbsps.	 3 heaped tbsps.	 3 heaped tbsps.	 3 heaped tbsps.	 3 heaped tbsps.
Tinned tomatoes	 1/10 x 400g tin (40g)	 1/5 x 400g tin (80g)	 1/5 x 400g tin (80g)	 1/5 x 400g tin (80g)	 1/5 x 400g tin (80g)	 1/5 x 400g tin (80g)
Vegetable soup	 1/2 small bowl (100g)	 1 small bowl (200g)	 1 small bowl (200g)	 1 small bowl (200g)	 1 small bowl (200g)	 1 small bowl (200g)

Fruit and Vegetables (At least 3 portions vegetables and 2 portions fruit per day)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Age range	2-3 years	4-6 years	7-10 years	11-13 years	14-18 years	19-64 years
White fish, oven cooked (cod, haddock, plaice)	 1/4 fillet (30g)	 3/4 fillet (90g)	 3/4 fillet (90g)	 1 fillet (120g)	 1 1/4 fillet (150g)	 1 fillet (120g)
Tuna, tinned in brine or spring water	 1 tbsp. (35g)	 2 tbsp. (70g)	 2 1/2 tbsp. (85g)	 3 tbsp. (100g)	 4 tbsp. (130g)	 3 1/2 tbsp. (115g)
Sliced roast beef	 1 slice (25g)	 2 slices (50g)	 3 slices (75g)	 3 slices (75g)	 4 slices (100g)	 4 slices (100g)
Chicken nuggets ●	 1 nugget (15g)	 2 1/2 nuggets (30g)	 3 nuggets (40g)	 4 nuggets (50g)	 5 nuggets (60g)	 4 nuggets (50g)

Beans, pulses, fish, eggs, meat and other proteins (2-3 portions per day)

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

How much food should a person with PWS eat every day?

The table below shows the recommended number of portions from each food group a person with PWS needs every day. Depending on individual needs, your healthcare professional may suggest something different.

Food Group	Number of portions each day
Vegetables	At least 3
Fruit	2
Potatoes, bread, rice, pasta and other starchy carbohydrates	6-8
Beans, pulses, fish, eggs, meat and other proteins. <i>Include at least 1 portion of oily fish such as salmon, herring or mackerel every week.</i>	2-3
Dairy and alternatives	3
Oils and spreads	3
Foods and drinks high in fat, salt or sugar	Not recommended



RESULTS

Design of 24 hr meal plan

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Monday			
Meal/ snack	Food	Food group	Number of portions
Breakfast	1½ wheat biscuits	Potatoes, bread, rice, pasta and other starchy carbohydrates	1
	210ml skimmed milk	Dairy and alternatives	1
	1½ plums	Fruit	1
Snack	3 breadsticks	Potatoes, bread, rice, pasta and other starchy carbohydrates	1
	2 tbsp. hummus	Beans, pulses, fish, eggs, meat and other proteins	1
Lunch	2 slices wholegrain bread	Potatoes, bread, rice, pasta and other starchy carbohydrates	2
	1½ tsp. reduced-fat spread	Oils and spreads	1
	3 slices roast beef	Beans, pulses, fish, eggs, meat and other proteins	1
	5cm cucumber and 6 cherry tomatoes	Vegetables	1
	$\frac{2}{3}$ banana	Fruit	1
Snack	$\frac{2}{3}$ small matchbox sized piece of cheese	Dairy and alternatives	1
	$\frac{3}{4}$ wrap	Potatoes, bread, rice, pasta and other starchy carbohydrates	1
Dinner	½ salmon fillet, oven cooked	Beans, pulses, fish, eggs, meat and other proteins	1
	2 egg-sized potatoes	Potatoes, bread, rice, pasta and other starchy carbohydrates	1
	3 heaped tbsp. carrots	Vegetables	1
	3 heaped tbsp. broccoli	Vegetables	1
	1 tsp. olive oil	Oils and spreads	1
	1 fromage frais (85g)	Dairy and alternatives	1

12 yr old girl

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8

RESULTS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Nutrient	2yo M	2yo F	5yo M	5yo F	8yo M	8yo F	12yo M	12yo F	16yo M	16yo F	Adult M	Adult F
Protein %	288	288	354	354	302	302	231	236	208	258	192	236
Fat %	61	66	62	67	60	64	57	61	51	62	51	64
Carbohydrate (mse) %	40	44	44	49	41	44	41	44	36	44	31	40
Energy (kcal) %	59	64	63	69	61	66	58	62	52	64	49	62
Energy (kJ) %	60	64	63	69	62	66	58	62	52	64	49	62
NSP (Englyst) %											61	61
Saturated fats %	62	67	49	54	49	53	48	51	41	50	40	51
Mono-unsat.fats %	47	50	37	40	39	42	34	36	29	36	28	36
Poly-unsat.fats %	41	45	34	37	36	39	33	35	28	35	25	32
Trans.fats %	13	14	10	11	10	11	9	10	8	10	8	10
Sodium (Na)	121	121	130	130	84	84	81	81	97	97	78	78
Potassium (K)	157	157	196	196	122	122	90	90	91	91	84	84
Calcium (Ca)	120	120	121	121	108	108	77	96	86	108	109	109
Magnesium (Mg)	125	125	157	157	104	104	89	89	97	97	83	92
Phosphorus (P)	213	213	247	247	231	231	161	200	191	237	234	234
Iron (Fe)	64	64	134	134	105	105	99	76	115	88	131	77
Copper (Cu)	94	94	119	119	109	109	115	115	106	106	77	77
Zinc (Zn)	85	85	110	110	127	127	112	112	130	176	119	161
Chloride (Cl)	114	114	118	118	77	77	71	71	81	81	64	64
Selenium (Se)	100	100	113	113	112	112	81	81	66	77	50	62
Iodine (I)	76	76	69	69	76	76	80	80	86	86	80	80
Vitamin D	36	36										
Thiamin	141	153	166	182	152	163	147	158	126	154	118	151
Riboflavin	124	124	139	139	128	128	137	149	142	167	135	160
Niacin	112	120	130	142	144	155	128	137	116	143	105	134
Vitamin B6	120	120	141	141	128	128	124	124	119	119	126	126
Vitamin B12	673	673	557	557	694	694	632	632	630	630	550	550
Folate	151	151	189	189	131	131	121	121	135	135	123	123
Vitamin C	115	115	225	225	226	226	202	202	183	183	182	182
Vitamin A (TRE)	264	264	494	494	397	397	342	342	294	342	293	342
Protein % of energy	22	22	21.7	21.7	25	25	23.3	23.3	24.2	24.2	24.6	24.6
Carbohydrate % of energy	40.3	40.3	41.9	41.9	38.9	38.9	40.5	40.5	39.8	39.8	37.3	37.3
Fat % of energy	34.7	34.7	32.9	32.9	32.9	32.9	33.2	33.2	33	33	35.3	35.3
Fibre % of energy	3	3	3.5	3.5	3.2	3.2	3.1	3.1	2.9	2.9	2.8	2.8



1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Conclusion nutritional analysis of 24 hr meal plan

- **Appropriate reduction of calorie content** to approx. 65-70% for most age groups
- Calorie restriction maybe more than intended for adult males
- Vitamin requirement generally met, apart from Vit D
- Mineral requirement is not met for several minerals (Zn, iodine, iron, calcium) in all or specific age ranges.
- Therefore, a mineral supplement is recommended

Additional information in the booklet

- **General introduction about PWS**
- **Who is it for?** Anyone with PWS or carers of a child, young person or adult with PWS. It can help to **explain PWS and show appropriate portion sizes to others.**
- **A message for people with PWS** Ask for help if there is anything they do not understand
- **Cooking methods** Advise to use steaming, baking, grilling, boiling and microwaving rather than frying.
- **Food security and food seeking tips,** including advise for schools
- **Puberty** Boys in puberty may need up to an additional 250 kcal per day
- **Supplement** A vitamin and mineral supplement with iron, zinc, vitamin A and D is recommended
- **Fluids** Children aged 2-3 years should aim to drink 6-7 glasses a day. From 4 years onwards, 6-10 glasses a day. A glass is about 200ml.





STRENGTHS + LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

Strengths and limitations

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

STRENGTHS +LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

STRENGTHS +LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

 STRENGTHS +LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

STRENGTHS	LIMITATIONS
Used accurate measurements	Multiple combinations – unpractical to do all
Used most trusted source of nutrient content of foods	Different countries have different nutrient requirements

STRENGTHS +LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

STRENGTHS	LIMITATIONS
Used accurate measurements	Multiple combinations – unpractical to do all
Used most trusted source of nutrient content of foods (Public Health England)	Different countries have different nutrient requirements

STRENGTHS +LIMITATIONS

1) To develop a national pictorial resource defining and illustrating correct portion sizes for children with PWS.

2) To assess the nutritional adequacy of these proposed intakes.

STRENGTHS	LIMITATIONS
Visual guide	Only 60 foods
Contains commonly eaten foods	May not represent every full cultural diets
User involvement	Contain foods we wouldn't necessarily recommend
Unique	Not individualised
	Some micronutrients may not achieve the recommendation

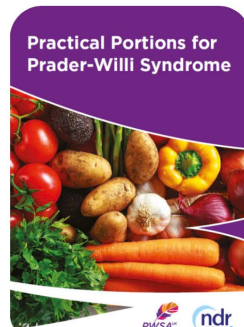
STRENGTHS	LIMITATIONS
Used accurate measurements	Multiple combinations – unpractical to do all
Used most trusted source of nutrient content of foods (Public Health England)	Different countries have different nutrient requirements

Use of the resource (Oct 2024-April 2025)

It is an absolutely brilliant resource, so clear and easy to understand.

I love it we use it when we do our daughters' meals, I love that there are tablespoons options really helpful for when dishing up dinner.

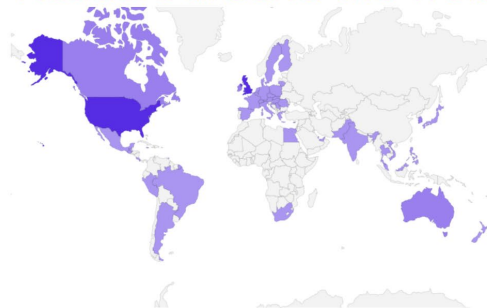
*This would help me so I can provide myself with a balanced diet without putting myself at risk.
(Adult with PWS)*



PRACTICAL PORTIONS

Food group	Number of portions each day
Vegetables	At least 3
Fruit	2
Potatoes, bread, rice, pasta and other starchy carbohydrates	6-8
Beans, pulses, fish, eggs, meat and other proteins Include at least 1 portion of oily fish such as salmon, herring or mackerel every week.	2-3
Dairy and alternatives	3
Oils and spreads	3
Foods and drinks high in fat, salt or sugar	Not recommended

Readers around the world



This will be a great resource to share with the rest of the family as they never understand quantities that are suitable for our daughter

Since October 2024

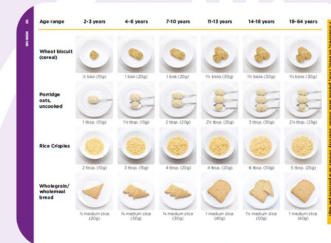
2,105 Copies Ordered

1,413 Online Reads

313 Downloads

Top 10 countries

UK - **545**
USA - **446**
Canada - **61**
Ireland - **49**
Australia - **41**
South Korea - **38**
France - **23**
Finland - **19**
New Zealand - **19**
Netherlands - **18**

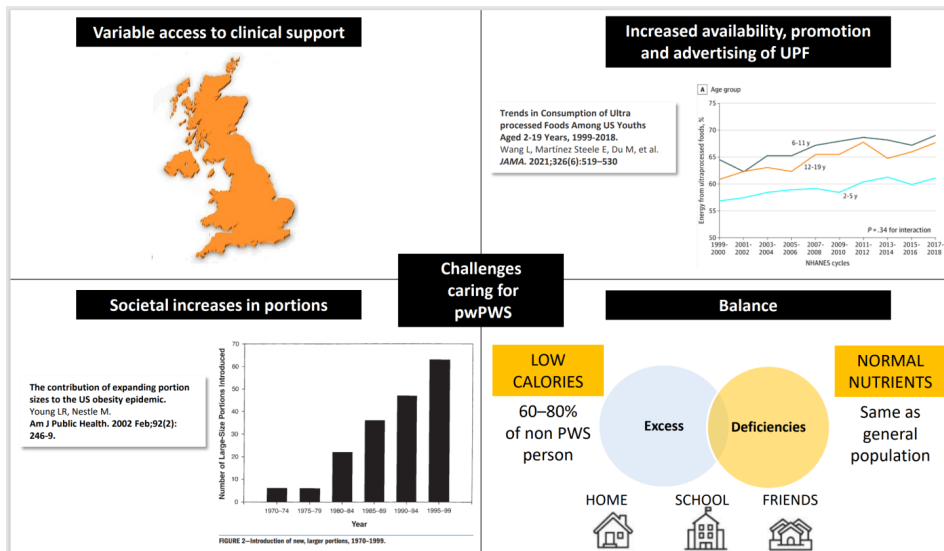


Conclusion

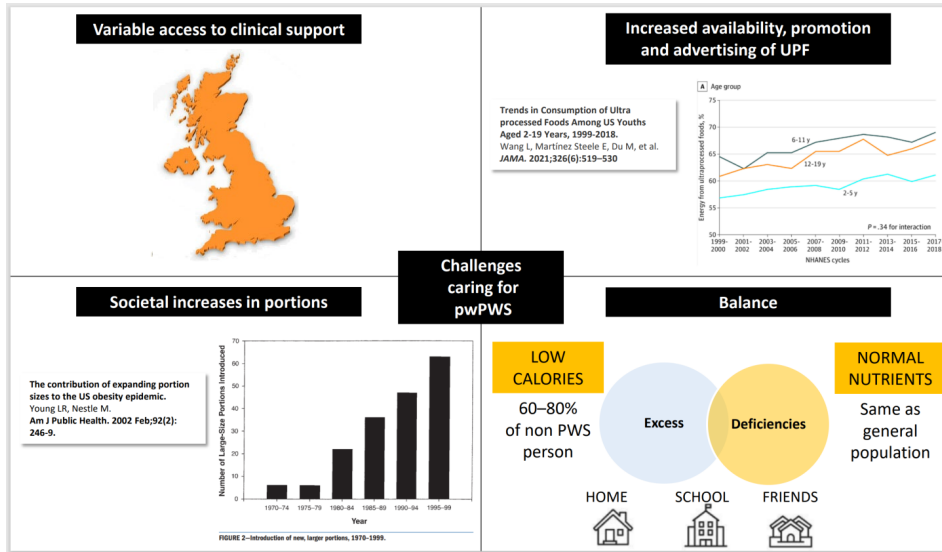
Important to get correct nutritional intake
for people with PWS to support their acute
and long-term health

CONCLUSION

Important to get correct nutritional intake
for people with PWS to support their acute
and long-term health



Important to get correct nutritional intake for people with PWS to support their acute and long-term health



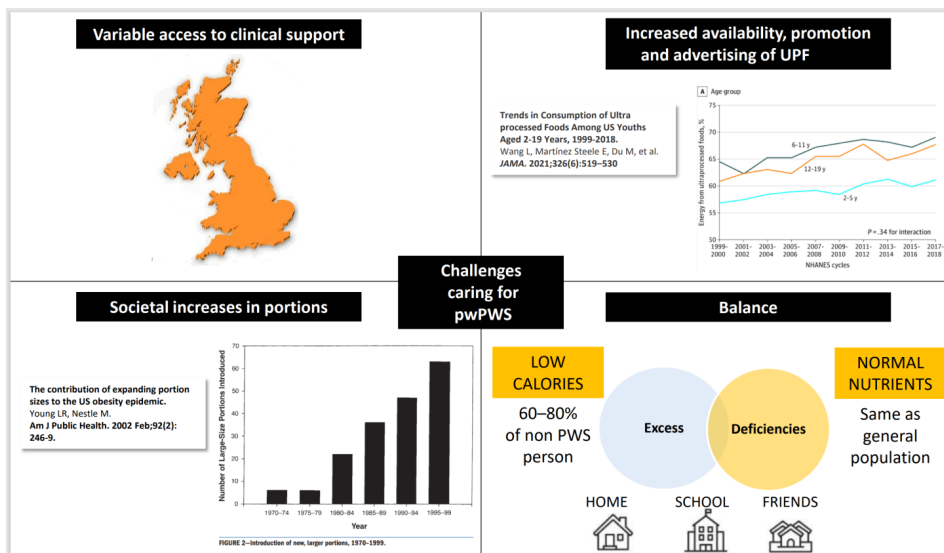
Unique and practical resource

- Advises portion size for PWS from 2 yrs of age that meets daily requirements
- Care is required with micronutrients and individualisation remains best

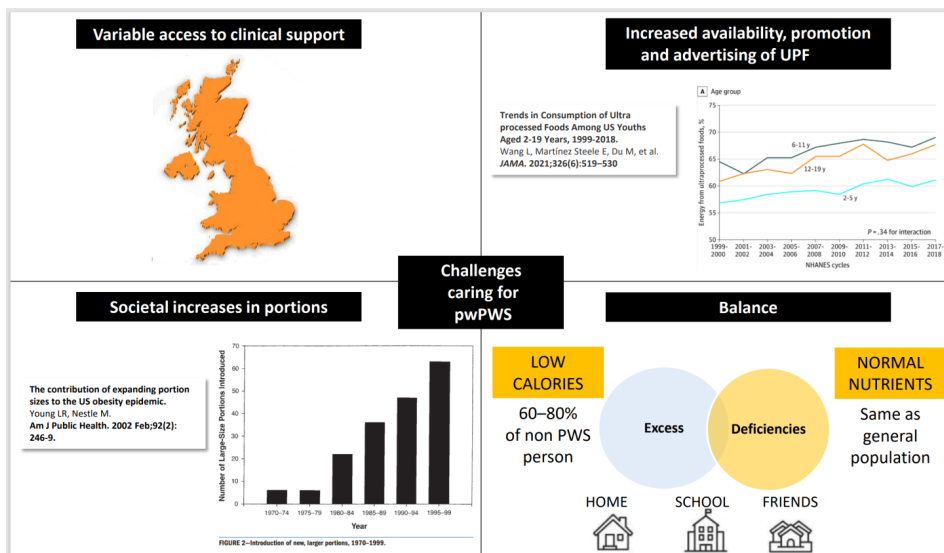
Important to get correct nutritional intake for people with PWS to support their acute and long-term health

Unique and practical resource

- Advises portion size for PWS from 2 yrs of age that meets daily requirements
- Care is required with micronutrients and individualisation remains best

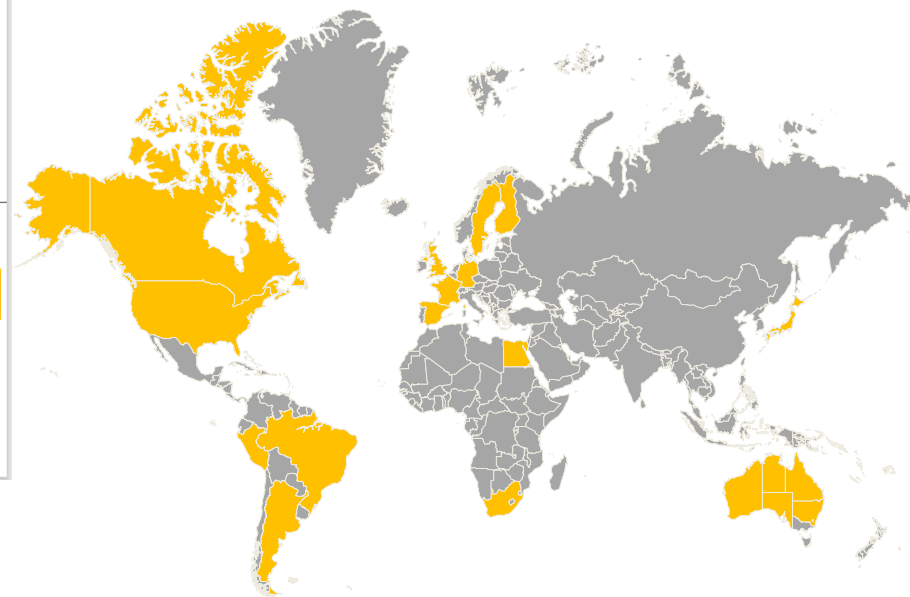


Important to get correct nutritional intake for people with PWS to support their acute and long-term health



Unique and practical resource

- Advises portion size for PWS from 2 yrs of age that meets daily requirements
- Care is required with micronutrients and individualisation remains best



Acknowledgements

Chris Smith, paediatric dietitian
University Hospitals Sussex Trust

Lisa Singh, paediatric dietitian
 Glasgow Children's Hospital

Paediatric PWS specialist clinic
Barts Health NHS Trust,
Royal London Hospital

- Sophie Aubrey, dietitian
- Isabel Sharratt, nurse
- Elizabeth Nash, psychologist
- Suren Thavanagram, respiratory physician

Centre for Endocrinology, Queen Mary University of London

- Marta Korbonits
- Federica Begali

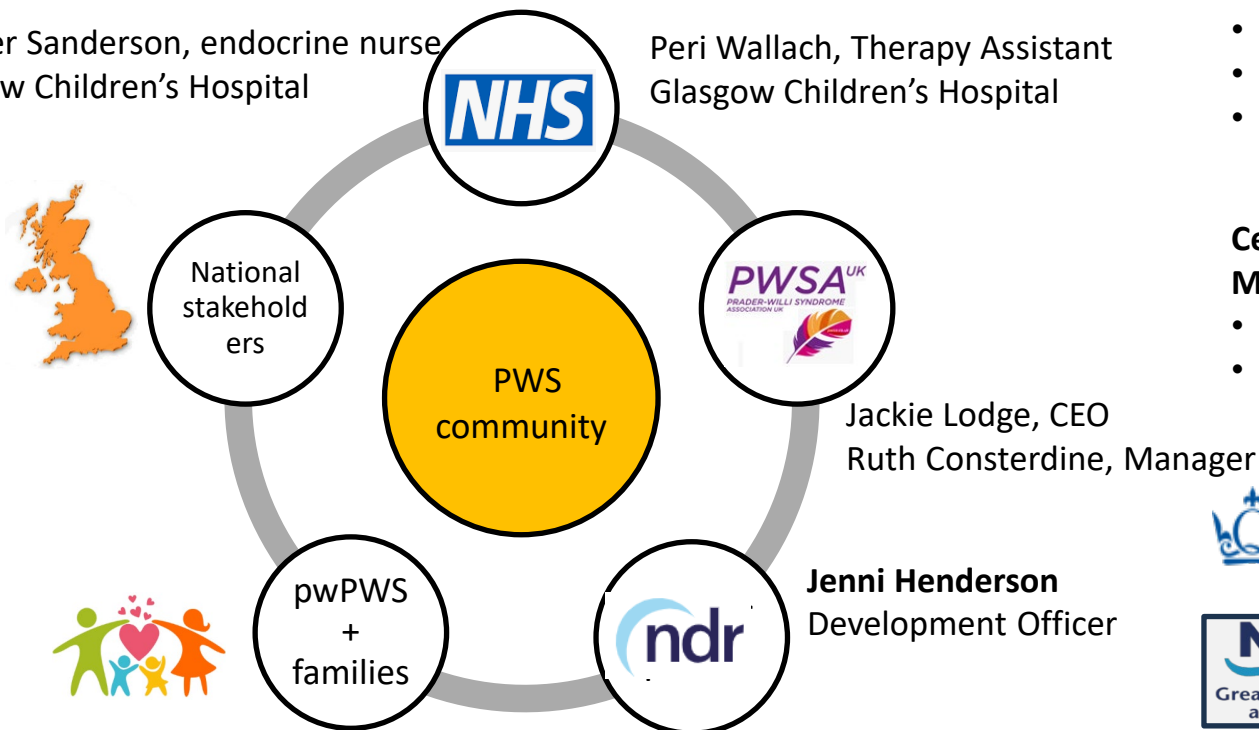
 **Barts and The London**
 School of Medicine and Dentistry




Barts Health
 NHS Trust

Jennifer Sanderson, endocrine nurse
 Glasgow Children's Hospital

Peri Wallach, Therapy Assistant
 Glasgow Children's Hospital



Thank you !



Evelien.gevers@nhs.net