FETA is a tool that is used to analyse data collected using the EPIC-Norfolk food frequency questionnaire and produce nutrient and food group values. FETA has been made freely available to the academic community. The program was created in such a way that it can be customised for different study populations; it is possible to delete/add foods and/or FFQ lines, and modify portion sizes as desired for a study. Nutrient data may also be easily modified or added. It is also possible for FETA to be used with other questionnaires containing a different set of line items or different numbers of frequencies.

Before we explain how to modify the FETA look-up files, it might be helpful to briefly describe the FETA look-up tables:

FETA Look-up Files:

01. foods.csv

Describes FFQ foods e.g. food-code "1064" is "Drinking chocolate powder".

02. nutrients.csv

Describes FFQ nutrients and food-groups calculated by FETA e.g. nut001 is alpha carotene, measured in mcg and nut905 is the food-group for Fruits, measured in grams.

03. meals.csv

Describes 130 FFQ meal ids i.e. 130 food lines from the main grid e.g. 1st line is Beef (Meat - beef - roast, steak, mince, stew or casserole).

04. food_nutrients.csv

Describes nutrient values per 100 grams of the FFQ foods e.g. 1064,065,1554 implies that 100 grams of "Drinking chocolate powder" (food-code=1064)* contains 1554 kJ of energy (nutrient code=065)**. Also used to assign food codes to food-groups e.g. 19056,906,100 implies that 100% of food code 19056 contributes to food-group "Meat and meat products".

05. weights.csv

Describes proportion of visible fat consumed with meat (Q10 from EPIC-Norfolk FFQ).

06. milks.csv

List of milk food codes available to FFQ.

07. portions.csv

Describes amount of milk (in grams) consumed for milk frequency options (Q4 from EPIC-Norfolk FFQ).

08. meal foods.csv

Describes look-up between FFQ meal id and foods it's mapped to e.g. 1 portion of Beefburgers (2nd FFQ line) contains 100g of food-code: 19029.

09. frequencies.csv

Describes conversion factor for FFQ frequencies (main grid, portions/day) e.g. frequency value 6 means 1.00 portion per day.

10. cereals.csv

List of cereal food codes available to FFQ

04.* foods.csv

04.** nutrients.csv

FETA Food-groups:

14260,905,100

While calculating nutrients, FETA also calculates food-group data. In order to calculate food-group data, FETA uses the look-up file: food_nutrients.csv, where each of the 290 FFQ food codes are mapped to 14 mutually-exclusive food-groups. For example: if we select observations for the food-group 905 i.e. Fruits from the look-up file "food_nutrients.csv", we get the following FFQ foods:

FOOD_NUTRIENTS.CSV Food Description 14013,905,100 "Apples, eating, average, raw, flesh and skin weighed with core" 14025,905,100 "Apricots, raw" 14031,905,100 "Apricots, dried" 14037,905,100 "Avocado, average" "Bananas" 14045,905,100 "Fruit cocktail, canned in juice" 14096,905,100 "Fruit cocktail, canned in syrup" 14097,905,100 "Grapefruit, raw" 14105,905,100 14109,905,100 "Grapes, average" "Kiwi fruit, weighed with skin" 14124,905,100 14153,905,100 "Melon, average" "Oranges, weighed with peel and pips" 14176,905,100 14183,905,100 "Peaches, raw" 14191,905,100 "Pears, average, raw, weighed with core" 14193,905,100 "Pears, average, raw, peeled, weighed with skin and core" "Plums, average, raw" 14213,905,100 "Prunes, dry, no stones" 14231,905,100 "Raisins" 14242,905,100 14244,905,100 "Raspberries, raw"

The value 100 (above) instructs FETA to use 100% of the food consumed in order to calculate food-group consumption.

You can use this information to create your own food-groups as long as the food-groups you create are mutually-exclusive.

Currently, 100% of Coleslaw (food-code=15077) is assigned to "Vegetables" food-group.

If you want to disaggregate this food-code, you can assign 71% of Coleslaw to "Vegetables" and 29% to "Soups and Sauces" food-group.

Check Modification no. 10 to see how to do this.

"Strawberries, raw"

How to use FETA to process data from modified Food Frequency Questionnaires?

In the following section, we explain how to carry out the more common changes if you would like to process your own FFQ data from Food Frequency Questionnaires (different to EPIC-Norfolk FFQ) using FETA software by changing the FETA look-up files alone.

- 01. Modify the portion weight of an existing food item
- 02. Remove/add a meal id
- 03. Add a new frequency value
- 04. Modify existing nutrient data
- 05. Add a new food item
- 05a. Add a new food item (Cereal)
- 05b. Add a new food item (Milk)
- 05c. Add a new food item (Fat)
- 05d. Add a new food item (Main FFQ grid)
- 06. Add data for a new nutrient
- 07. Update frequency portions for milk (Q5 from EPIC-Norfolk FFQ)
- 08. Update options for visible fat on meat (Q10 from EPIC-Norfolk FFQ)
- 09. Update modifier for an existing food
- 10. Update food-grouping information
- 11. Multiple updates to FETA

01. Modify the portion weight of an existing food item

Each line in the Food Frequency Questionnaire (also known as a meal) corresponds to one or more food codes. There are 130 meals in the standard EPIC-Norfolk Questionnaire. In order to amend portion weights for a line in the FFQ, you may need to modify the portion weights of the necessary food codes. Should you wish to change the weight of an existing food item, all that is needed is to amend the current weight of this food in the 'meal_foods.csv' file to your chosen weight. Please remember to amend the portions of any other foods in this meal_id, if required.

Example: if you would like to change portion weight for savoury pies (food code: 19069 => 10 and food code: x0535 => 10) then the look-up file "meal_foods.csv" would change as follows:

```
1.1 MEAL FOODS.CSV (BEFORE)
"MEAL", "FOOD_CODE", "AMOUNT", "MODIFIER"
"SAVOURY_PIES","",1,"b"
"SAVOURY_PIES","19056",30,
"SAVOURY_PIES","19063",30,
"SAVOURY_PIES","19067",10,
"SAVOURY_PIES","19068",10,
"SAVOURY_PIES","19069",15,
"SAVOURY PIES", "x0535", 15,
1.1 MEAL FOODS.CSV (AFTER)
"MEAL", "FOOD CODE", "AMOUNT", "MODIFIER"
"SAVOURY_PIES","",1,"b"
"SAVOURY PIES", "19056", 30,
"SAVOURY_PIES","19063",30,
"SAVOURY_PIES","19067",10,
"SAVOURY_PIES","19068",10,
"SAVOURY_PIES","19069",10,
"SAVOURY_PIES","x0535",10,
```

02. Remove/add a meal_id

2.1 MEALS.CSV (BEFORE)

"LINE NUMBER", "FFQNAME", "SGDESC"

If you need to remove an existing meal_id, you need to delete all data-lines related to this meal_id from 'meals.csv'. All data related to deleted foods (mapped to this meal_id) should also be removed provided they are not used for any other meals from: 'foods.csv', 'meal_foods.csv' and 'food_nutrients.csv' respectively. If you wish to create a new meal_id, add the necessary information to: 'meals.csv', 'foods.csv', 'meal_foods.csv' and 'food_nutrients.csv'.

Example: If you would like to add a new meal_id for "Mexican bean burger, commercial, grilled" then you need to modify the following look-up files:

129, "LENTILS", "Legumes - dried lentils/beans/peas" 130, "TOFU", "Vegetable dishes - soya foods" 2.1 MEALS.CSV (AFTER) "LINE NUMBER", "FFQNAME", "SGDESC" _____ 129, "LENTILS", "Legumes - dried lentils/beans/peas" 130, "TOFU", "Vegetable dishes - soya foods" 131, "BEANBURGER", "Mexican bean burger, commercial, grilled" There are 130 meals in the standard EPIC-Norfolk Questionnaire. In this example, 131 is the new meal id. 2.2 MEALS FOODS, CSV (BEFORE) "MEAL", "FOOD CODE", "AMOUNT", "MODIFIER" "LENTILS","13092",35, "LENTILS","13142",35, "TOFU","13119",50, "TOFU","15314",6, "TOFU","15330",33, 2.2 MEALS FOODS.CSV (AFTER) "MEAL", "FOOD_CODE", "AMOUNT", "MODIFIER" "LENTILS","13092",35, "LENTILS","13142",35, "TOFU","13119",50, "TOFU","15314",6, "TOFU","15330",33, "BEANBURGER","12345",100, 2.3 FOODS.CSV (BEFORE) FOOD CODE, DESC x3016, "Potatoes, roast, fat removed" x3025, "Chips, straight cut, fat removed" 2.3 FOODS.CSV (AFTER) FOOD_CODE,DESC x3016, "Potatoes, roast, fat removed"

x3025, "Chips, straight cut, fat removed"

12345, "Mexican bean burger, commercial, grilled"

2.4 FOOD_NUTRIENTS.CSV (BEFORE) FOOD CODE,NUTRIENT,QUANTITY

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00

2.4 FOOD_NUTRIENTS.CSV (AFTER) FOOD_CODE, NUTRIENT, QUANTITY

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00 12345,065,500 12345,913,100

There are 290 foods in the standard EPIC-Norfolk Questionnaire. In this example, "12345" is the new food code.

For simplicity, we're only updating Energy (in kJs) for the new food code, but you should update all the nutrients you wish to calculate using FETA software. You would also need to assign the new food code to food-group '913' i.e. 'Vegetables'. The 100 in the data-line "12345,913,100" would always be 100 in order to add 100% of the quantity of food consumed to the food-group: 'Vegetables'.

* Data entry template should be updated by adding an extra column with "BEANBURGER" as the column heading.

03. Add a new frequency value

If you wanted to add a new frequency, then you would make the necessary additions to the 'frequencies.csv' file. New frequencies should be translated into per day and existing frequencies amended as necessary.

Example: If you would like to separate the frequency option for "never or once a month" into two say, "never" and "once a month", then you would need to introduce a new frequency value and modify the 'frequencies.csv' to map the frequency values: 1 to 10 to "never", "once a month" up to "6+ per day" as follows:

3.1 FREQUENCIES.CSV (BEFORE)

CODE, VALUE

1,0.00

2,0.07

3,0.14

4,0.43

5,0.79

6,1.00

7,2.50

8,4.50

9,6.00

3.1 FREQUENCIES.CSV (AFTER)

CODE, VALUE

1,0.00

2,0.03

3,0.07

4,0.14

5,0.43

6,0.79

7,1.00

8,2.50

9,4.50

10,6.00

04. Modify existing nutrient data

If you wish to modify the nutrient content of a food item, then you need to edit the current quantity per 100g in the 'food_nutrients.csv' file.

Example: If you would like to modify the energy value (in kJs) for an existing food code e.g. '12345' i.e. "Mexican bean burger, commercial, grilled" from 150 to 1500, then you would need to update the 'food_nutrients.csv' file as follows:

4.1 FOOD_NUTRIENTS.CSV (BEFORE) FOOD CODE.NUTRIENT.QUANTITY

12345,001,0.00

12345,002,0.00

12345,005,0.00

12345,015,1.10

12345,017,13.33

12345,065,150

4.1 FOOD_NUTRIENTS.CSV (AFTER) FOOD CODE, NUTRIENT, QUANTITY

12345,001,0.00

12345,002,0.00

12345,005,0.00

12345,015,1.10

12345,017,13.33

12345,065,1500

05a. Add a new food item (Cereal)

If you wish to add a new food item to an existing meal_id, then you need to update the following files: 'meals.csv', 'foods.csv', 'meal_foods.csv' and 'food_nutrients.csv'. Please remember to amend the portions of existing foods in this meal_id, if required. New cereal and milk food items are added to 'cereals.csv' and 'milks.csv' respectively, as well as to 'foods.csv'. Nutrient data for new food items are added to 'food_nutrients.csv'.

Example: If you would like to add a new cornflakes-type cereal food code e.g. '99999' for 'New breakfast cereal (test)' then you would need to modify the following look-up files as:

If this cereal food code is dense like muesli, then you would need to use "2" as "WEIGHT_ID" because weight of single portion of cornflakes type cereals is 30 grams whereas it's 60 grams for muesli type cereals.

5a.2 FOODS.CSV (BEFORE) FOOD_CODE,DESC -----x3016."Potatoes, roast, fat ren

x3016,"Potatoes, roast, fat removed" x3025,"Chips, straight cut, fat removed"

5a.2 FOODS.CSV (AFTER) FOOD_CODE,DESC

x3016, "Potatoes, roast, fat removed" x3025, "Chips, straight cut, fat removed" 99999, "New breakfast cereal(test)"

5a.3 FOOD_NUTRIENTS.CSV (BEFORE) FOOD_CODE,NUTRIENT,QUANTITY

v3025 629 0 00

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00

5a.3 FOOD_NUTRIENTS.CSV (AFTER) FOOD_CODE,NUTRIENT,QUANTITY

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00 99999,065,100

99999,901,100

For simplicity, we're only updating Energy (in kJs) for the new food code, but you should update all the nutrients you wish to calculate using FETA software. You would also need to assign the new cereal food code to food-group '901' i.e. 'Cereals and cereal products'. The 100 in the data-line "99999,901,100" would always be 100 in order to add 100% of the quantity of cereal consumed to the food-group: 'Cereals and cereal products'.

05b. Add a new food item (Milk)

5b.1 MILKS.CSV (BEFORE)

Example: If you would like to add a new food code for milk e.g. 'a9999' for 'New Milk (test)' then you would need to modify the following look-up files as:

"CODE","FOOD_CODE" 14."a2002" 15,"a2003" 16,"12130" 5b.1 MILKS.CSV (AFTER) "CODE", "FOOD_CODE" 14,"a2002" 15,"a2003" 16,"12130" 17,"a9999" 5b.2 FOODS.CSV (BEFORE) FOOD CODE, DESC x3016, "Potatoes, roast, fat removed" x3025, "Chips, straight cut, fat removed" 5b.2 FOODS.CSV (AFTER) FOOD CODE, DESC x3016, "Potatoes, roast, fat removed" x3025, "Chips, straight cut, fat removed" a9999,"New Milk(test)" 5b.3 FOOD_NUTRIENTS.CSV (BEFORE) FOOD_CODE, NUTRIENT, QUANTITY x3025,629,0.00 x3025,630,0.00 x3025,910,100.00 5b.3 FOOD NUTRIENTS.CSV (AFTER) FOOD CODE, NUTRIENT, QUANTITY x3025,629,0.00

x3025,630,0.00 x3025,910,100.00 a9999,065,50 a9999,907,100

For simplicity, we're only updating Energy (in kJs) for the new food code, but you should update all the nutrients you wish to calculate using FETA software. You would also need to assign the new milk food code to food-group '907' i.e. 'Milk and milk products'. The 100 in the data-line "a9999,907,100" would always be 100 in order to add 100% of the quantity of milk consumed to the food-group: 'Milk and milk products'.

05c. Add a new food item (Fat)

Example: If you would like to add a new food code for fat (frying or baking) e.g. '17999' for 'Extra Virgin Olive Oil' then you would need to modify the following look-up files as:

5c.1 FOODS.CSV (BEFORE) FOOD CODE,DESC

x3016, "Potatoes, roast, fat removed" x3025, "Chips, straight cut, fat removed"

5c.1 FOODS.CSV (AFTER) FOOD_CODE,DESC

x3016,"Potatoes, roast, fat removed" x3025,"Chips, straight cut, fat removed" 17999,"Extra Virgin Olive Oil"

5c.2 FOOD_NUTRIENTS.CSV (BEFORE)
FOOD CODE,NUTRIENT,QUANTITY

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00

5c.2 FOOD_NUTRIENTS.CSV (AFTER) FOOD_CODE,NUTRIENT,QUANTITY

x3025,629,0.00 x3025,630,0.00 x3025,910,100.00 17999,065,3350 17999,903,100

For simplicity, we're only updating Energy (in kJs) for the new food code, but you should update all the nutrients you wish to calculate using FETA software. You would also need to assign the new fat food code to food-group '903' i.e. 'Fats and oils'. The 100 in the data-line "17999,903,100" would always be 100 in order to add 100% of the quantity of fat consumed to the food-group: 'Fats and oils'.

05d. Add a new food item (Main FFQ grid)

Example: If you would like to add a new food code for any other food e.g. 'x9999' for 'Turnip, boiled in salted water' and add it to existing meal_id i.e. "PARSNIPS" then you would need to modify the following look-up files as:

5d.1 FOODS.CSV (BEFORE) FOOD_CODE,DESC

x3016,"Potatoes, roast, fat removed" x3025,"Chips, straight cut, fat removed"

5d.1 FOODS.CSV (AFTER) FOOD_CODE,DESC

x3016,"Potatoes, roast, fat removed" x3025,"Chips, straight cut, fat removed" x9999,"Turnip, boiled in salted water"

5d.2 MEALS_FOODS.CSV (BEFORE)

"MEAL", "FOOD_CODE", "AMOUNT", "MODIFIER"

"PARSNIPS","13313",32,

"PARSNIPS","13360",42,

5d.2 MEALS_FOODS.CSV (AFTER)

"MEAL","FOOD_CODE","AMOUNT","MODIFIER"

"PARSNIPS","13313",32,

"PARSNIPS","13360",42,

"PARSNIPS", "x9999", 52,

5d.3 FOOD_NUTRIENTS.CSV (BEFORE)

FOOD CODE, NUTRIENT, QUANTITY

x3025,629,0.00

x3025,630,0.00

x3025,910,100.00

5d.3 FOOD_NUTRIENTS.CSV (AFTER)

FOOD_CODE,NUTRIENT,QUANTITY

x3025,629,0.00

x3025,630,0.00

x3025,910,100.00

x9999,065,36

x9999,913,100

For simplicity, we're only updating Energy (in kJs) for the new food code, but you should update all the nutrients you wish to calculate using FETA software. You would also need to assign the new food code to food-group '913' i.e. 'Vegetables'. The 100 in the data-line "x9999,913,100" would always be 100 in order to add 100% of the quantity of food consumed to the food-group: 'Vegetables'.

06. Add data for a new nutrient

Example: If you would like to calculate a new nutrient (measured in grams) then you would need to update 'nutrients.csv' and 'food_nutrients.csv' for new nutrient data per 100g for each FFQ food item as follows:

6.1 NUTRIENTS.CSV (BEFORE)

CODE, DESCRIPTION, UNITS

1,Alpha carotene,mcg

2,Alcohol,g

5,Beta carotene,mcg

911,Soups & sauces,g

912, Sugars; preserves and snacks, g

913, Vegetables, g

6.1 NUTRIENTS.CSV (AFTER)

CODE, DESCRIPTION, UNITS

1,Alpha carotene,mcg

2,Alcohol,g

5,Beta carotene,mcg

911, Soups & sauces, g

912, Sugars; preserves and snacks, g

913, Vegetables, g

914, New test nutrient, g

Here we assigned a code '914' to the new nutrient we would like FETA to calculate in grams.

6.2 FOOD_NUTRIENTS.CSV (BEFORE) FOOD_CODE,NUTRIENT,QUANTITY

x3025,629,0.00

x3025,630,0.00

x3025,910,100.00

6.2 FOOD_NUTRIENTS.CSV (AFTER) FOOD_CODE,NUTRIENT,QUANTITY

x3025,629,0.00

x3025,630,0.00

x3025,910,100.00

x3025,914,78.05

07. Update frequency portions for milk (Q5 from EPIC-Norfolk FFQ)

Example: Should you wish to add a new daily milk frequency then you need to update 'portions.csv' file as follows:

Question 4 from EPIC-Norfolk FFQ

How much milk did you drink each day, including milk with tea, coffee, cereals etc.?

- 1 -> None
- 2 -> Quarter of a pint
- 3 -> Half a pint
- 4 -> Three quarters of a pint
- 5 -> One pint
- 6 -> More than one pint (1.25 pints)

7.1 PORTIONS.CSV (BEFORE)

CODE, VALUE

1.0.00

2,146.0

3,293.0

4,439.0

5,585.0

6,732.0

Question 4 from Modified FFQ

How much milk did you drink each day, including milk with tea, coffee, cereals etc.?

```
1 -> None
2 -> Quarter of a pint
3 -> Half a pint
4 -> Three quarters of a pint
5 -> One pint
6 -> One and a quarter pint (1.25 pints)
7 -> One and a half pint (1.5 pints)
****** new milk consumption frequency *****

7.1 PORTIONS.CSV (AFTER)

CODE,VALUE
1,0.00
2,146.0
3,293.0
4,439.0
5,585.0
```

08. Update options for visible fat on meat (Q10 from EPIC-Norfolk FFQ)

Example: If you would like to update the existing options for consumption of 'visible fat on meat' from: 1 (ate most of the fat, 100%); 2 (ate some of the fat, 50%); 3 (ate as little as possible,0%); 4 (did not eat meat, 0%) to: 1 (ate most of the fat, 100%); 2 (ate some of the fat, 50%); 3 (ate as little as possible, 15%); 4 (did not eat visible fat, 0%); 5 (did not eat meat, 0%) then you would need to update 'weights.csv' as follows:

```
8.1 WEIGHTS.CSV (BEFORE)
CODE, VALUE
1,1.0
2,0.5
3,0.0
4,0.0
5,0.0

8.1 WEIGHTS.CSV (AFTER)
CODE, VALUE
1,1.0
2,0.5
3,0.15
4,0.0
5,0.0
```

6,732.0 7.877.5

09. Update modifier for an existing food

Visible fat: update 'meal_foods.csv' by adding an '"a"' to the food item about which you would like to know its visible fat consumption.

Baking fat: if you wish to incorporate the specific fat type of a baked food item, then you need to work out the baking fat content of this food, remove all the fat-related nutrients from it and insert a ""b" beside the baking fat quantity of the necessary 'MEAL' in the 'meal_foods.csv' file. Remember to adjust the weight of the food to reflect the absence of baking fat; the reduction in its weight will be the weight of the specific baking fat used in cooking the food. We suggest you amend the food code of the original food item, e.g. 12285 Quiche Lorraine, homemade to X2285 Quiche Lorraine, homemade, fat removed. Remember that nutrient data also needs to be adjusted.

Frying fat: if you wish to incorporate the specific fat type of a used in frying a specific food item, then you need to work out the frying fat content of this food, remove all the fat-related nutrients from it and insert a "d" beside the frying fat quantity of the necessary 'MEAL' in the 'meal_foods.csv' file. Remember to adjust the weight of the food to reflect the absence of frying fat; the reduction in its weight will be the weight of the specific frying fat used in cooking the food. We suggest you amend the food code and name of the original food item, e.g. 19029 Beefburgers, chilled/frozen, fried to X9029 Beefburgers, chilled/frozen, fat removed. Remember that nutrient data also needs to be adjusted.

Cereals: With the exception of muesli, all cereals have an average portion weight of 30g (this is 60g for muesli). If you think that the average portion of your cereal is more similar to 60 than 30gm, as it is a dense cereal, you can add or amend the '1' for the 'weight_id' to a '2'.

10. Update food-grouping information

The look-up file "food_nutrients.csv" provides nutrient/100 grams information for the 290 food-codes in the standard EPIC-Norfolk FFQ. This look-up file also contains information on how the quantity from these 290 food-codes are assigned to the 14 food-groups in the standard EPIC-Norfolk FFQ. Currently, 100% of Coleslaw (food-code=15077) is assigned to "Vegetables" food-group. If you would like to disaggregate this food-code, you can assign 71% of Coleslaw to "Vegetables" and 29% to "Soups and Sauces" food-group. You would need to modify "food_nutrients.csv" as follows:

10.1 FOOD_NUTRIENTS.CSV (AFTER) FOOD_CODE,NUTRIENT,QUANTITY

15077,911,29 15077,913,71

11. Multiple updates to FETA

If you would like to make a modification to FETA which results in e.g. addition of a new meal_id containing a new food code the, you would need to follows the following two steps:

- 1. Modify FETA look-up files to add a meal_id (Option No 2. Remove/add a meal_id)
- 2. Modify FETA look-up files to add a new food code (Option No 5. Add a new food item)

Similarly, if you have any other modifications, then you would need to convert it into smaller and distinct updates using the options mentioned above and implement one modification at a time.