

Adults with Cystic Fibrosis using Validated Diet Quality Index Tools: Healthy Eating Index 2020 (HEI-2020) and Diet Quality Index – International (DQI-I).

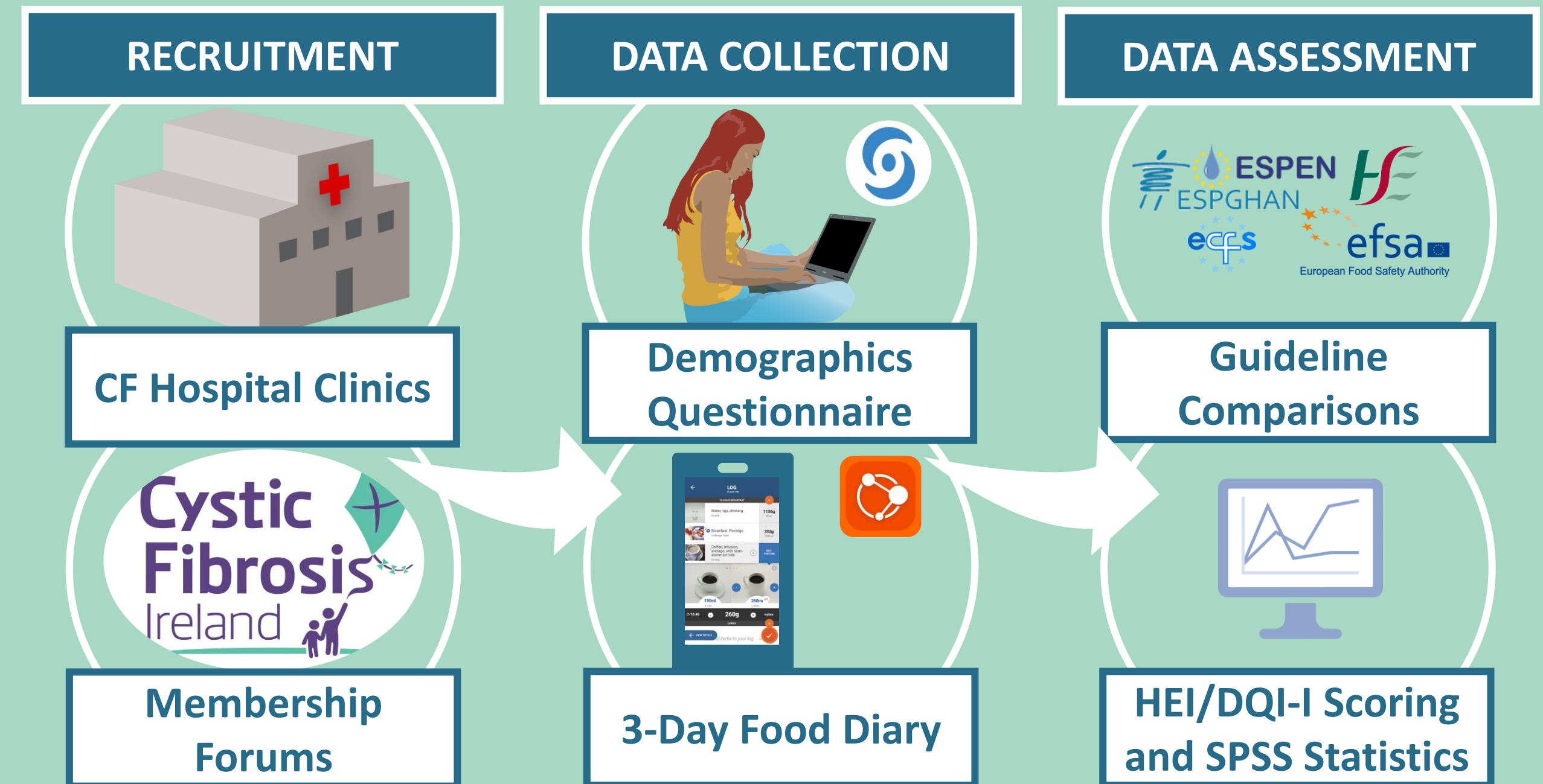
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BACKGROUND

Cystic Fibrosis (CF) is an autosomal recessive disorder (1) characterised by **recurring lung infections** which may result in **poorer lung function** and a **shorter life expectancy**. Other associated comorbidities include poorer pancreatic function, nutritional status and bone density. In recent years, improvements in **clinical practices** and **drug therapies** have altered the trajectory of CF prognosis, with many people with CF (pwCF) displaying **better health outcomes** and **living longer**, more fulfilling lives (2). However, other **metabolic clinical comorbidities** are emerging, specifically **diet-related chronic diseases** like **overweight/obesity (41%) (3)** and **cardiovascular disease risk factors (4)**. Traditional dietary practices have focused on achieving **high energy** and **fat intakes**, prioritising **growth** and **survival** (5). This remains relevant for some individuals with CF, however, the majority of pwCF should be encouraged to follow a healthier dietary pattern, focusing on **quality** as well as quantity, as alluded to in the most recent **CF European nutrition guidelines** (2). This aligns with **general population nutrition guidelines** which emphasise **diet quality** in reducing and **preventing diet related chronic diseases** (6). A systematic review on the dietary intakes of **adults** with CF revealed a **lack of data** on **diet quality** in the CF population (7). Prior to amending current published CF dietary guidelines or changing clinical practice, an assessment on the **diet quality** of **adults with CF** is warranted.

Aim: To provide a comprehensive evaluation of the dietary intakes and **diet quality** of Irish **adults** living with **CF** and assess **differences** in dietary intakes and diet quality across **demographic profiles**.

METHODS



RESULTS

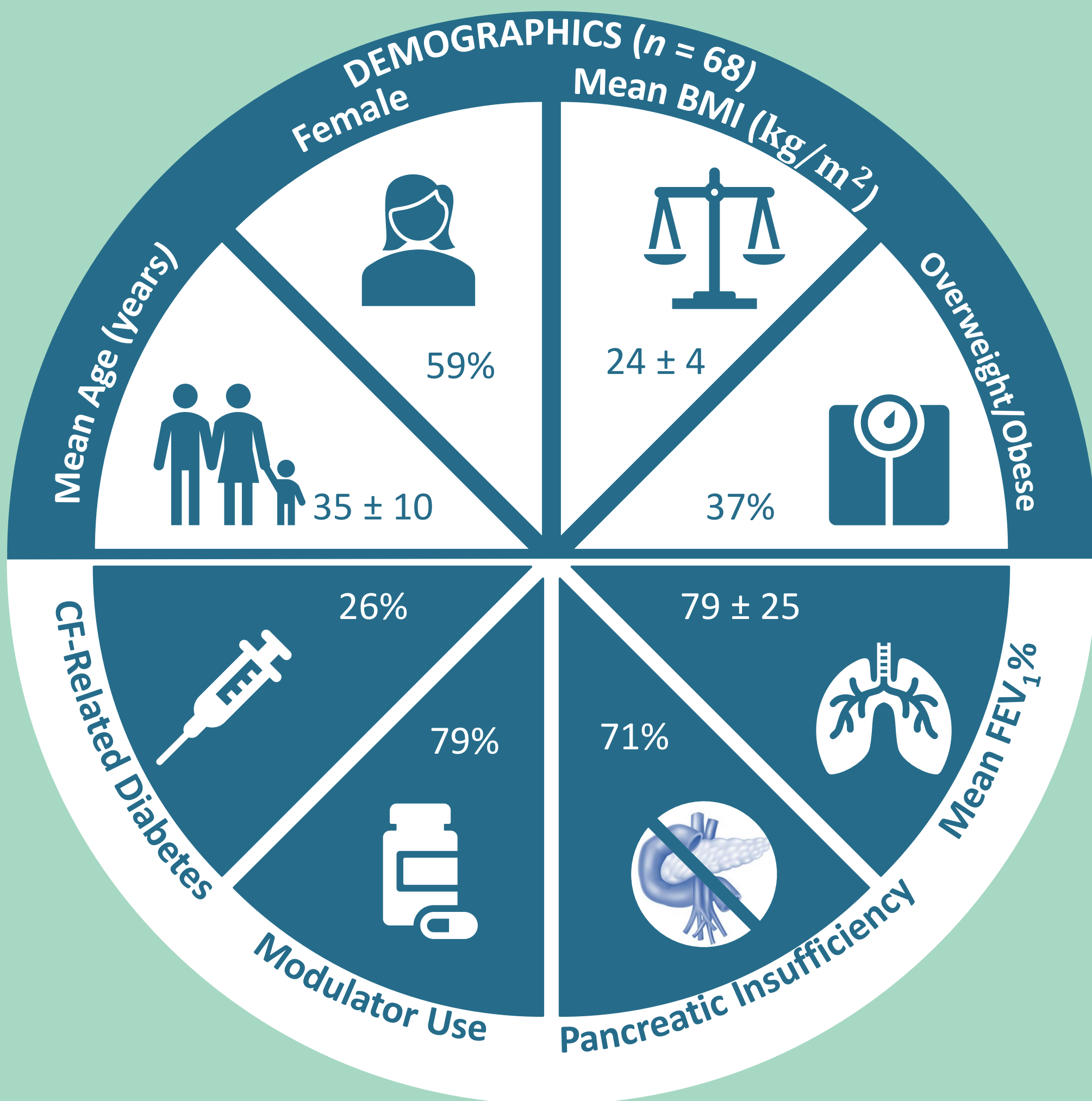


Figure 1. Demographics

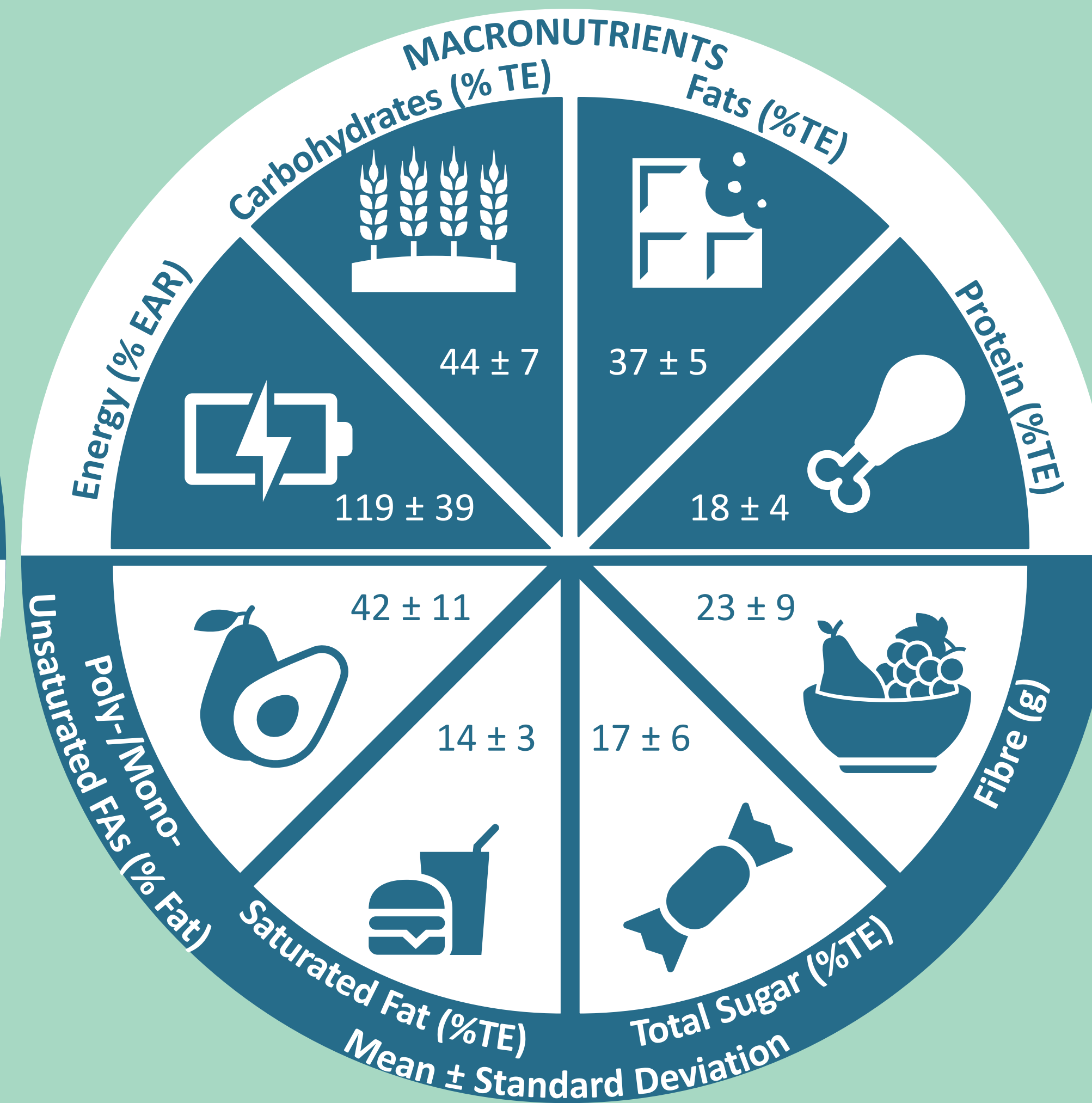


Figure 2. Mean Macronutrient Intakes of Irish Adults with CF

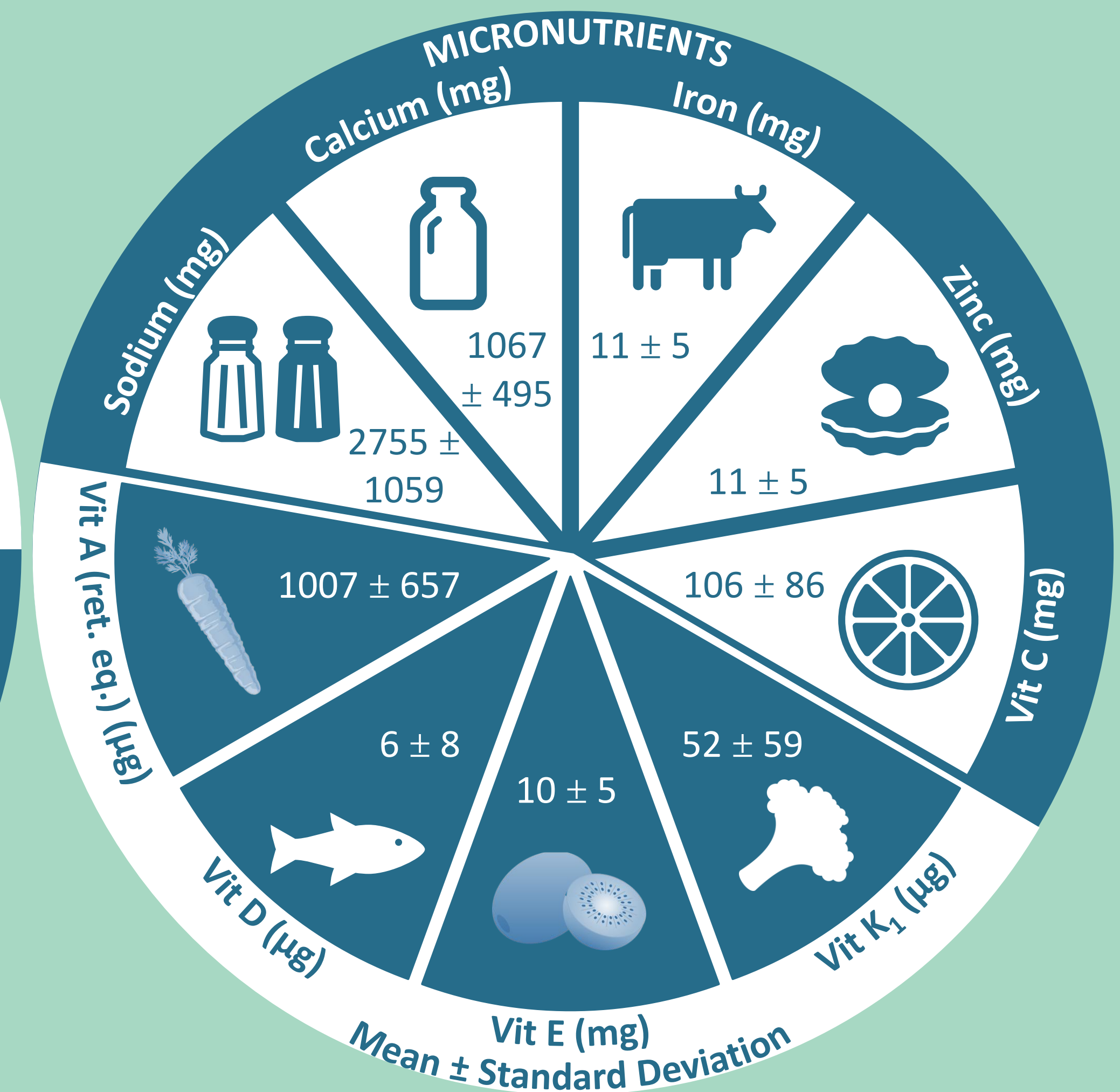


Figure 3. Mean Micronutrient Intakes of Irish Adults with CF

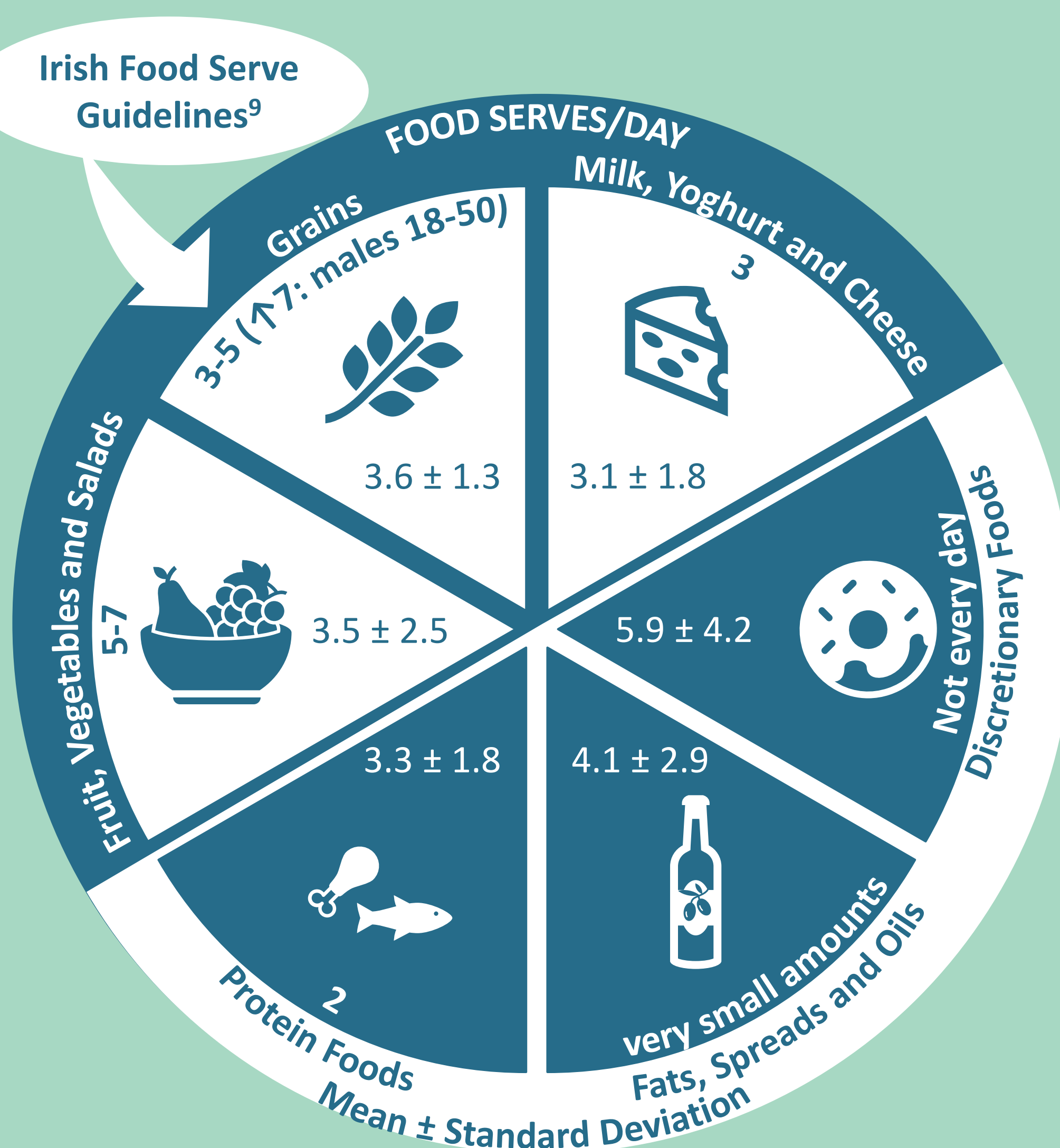


Figure 4. Mean Food Group Serves in Irish Adults with CF

Table 1. DQI-I & component scores in Irish adults with CF above and below the mean FEV ₁ %				
Diet Quality Measure	All	↓ Mean FEV ₁ %	↑ Mean FEV ₁ %	p-value
DQI-I Score (0-100)	51.2 ± 9.8	48.3 ± 8.7	53.6 ± 10.1	0.026
DQI-I Variety Component Scores (0-20)				
Food Group Variety Score (0-15)	11.8 ± 3.0	11.2 ± 2.6	12.2 ± 3.2	0.061
Within-Group Variety Score (0-5)	3.1 ± 1.6	3.1 ± 1.6	3.2 ± 1.6	0.778
DQI-I Adequacy Component Scores (0-40)				
Vegetables (0-5)	2.6 ± 1.6	2.2 ± 1.7	2.8 ± 1.5	0.109
Fruits (0-5)	2.3 ± 2.0	1.7 ± 1.8	2.8 ± 2.0	0.023
Grains (0-5)	2.4 ± 1.1	2.4 ± 0.9	2.5 ± 1.3	0.907
Fibre (0-5)	4.0 ± 1.3	3.6 ± 1.4	4.3 ± 1.1	0.018
Protein (0-5)	4.9 ± 0.3	5.0 ± 0.0	4.9 ± 0.3	0.382
Iron (0-5)	3.2 ± 1.5	3.4 ± 1.2	2.9 ± 1.7	0.250
Calcium (0-5)	4.0 ± 1.4	4.2 ± 1.4	3.8 ± 1.4	0.189
Vitamin C (0-5)	3.5 ± 1.7	3.3 ± 1.8	3.7 ± 1.7	0.342
DQI-I Moderation Component Scores (0-30)				
Total Fat (0-6)	0.4 ± 1.1	0.2 ± 0.8	0.5 ± 1.3	0.397
Saturated Fat (0-6)	0.4 ± 1.1	0.2 ± 0.8	0.5 ± 1.3	0.397
Cholesterol (0-6)	3.8 ± 2.6	3.7 ± 2.7	3.9 ± 2.4	0.834
Sodium (0-6)	3.5 ± 2.4	2.9 ± 2.5	4.0 ± 2.2	0.059
Empty Calorie (0-6)	0.7 ± 1.6	0.5 ± 1.4	0.8 ± 1.8	0.582
DQI-I Overall Balance Scores (0-10)				
Macro Ratio (0-6)	0.2 ± 0.8	0.1 ± 0.7	0.2 ± 0.9	0.724
Fatty Acid Ratio (0-4)	0.4 ± 1.0	0.6 ± 1.2	0.4 ± 0.8	0.719

Table 2. HEI-2020 & component scores in Irish adults with CF above and below the mean FEV ₁ %				
Diet Quality Measure	All	↓ Mean FEV ₁ %	↑ Mean FEV ₁ %	p-value
HEI-2020 Score (0-100)	59.3 ± 12.4	54.8 ± 12.9	62.8 ± 11.2	0.009
Total Fruits (0-5)	2.2 ± 1.6	1.7 ± 1.4	2.7 ± 1.7	0.017
Whole Fruits (0-5)	2.8 ± 2.0	2.2 ± 1.9	3.3 ± 2.0	0.025
Total Vegetables (0-5)	4.0 ± 1.1	3.8 ± 1.0	4.1 ± 1.2	0.167
Greens and Beans (0-5)	2.8 ± 1.9	2.4 ± 1.9	3.1 ± 1.9	0.131
Wholegrains (0-10)	5.1 ± 3.2	5.0 ± 3.6	5.2 ± 3.0	0.665
Dairy (0-10)	6.3 ± 2.9	5.7 ± 2.8	6.6 ± 2.9	0.206
Total Protein (0-5)	4.4 ± 0.8	4.3 ± 1.0	4.5 ± 0.7	0.475
Seafood/Plant Protein (0-5)	3.0 ± 2.0	2.7 ± 2.2	3.3 ± 1.8	0.163
Refined Grains (0-10)	7.5 ± 2.7	7.3 ± 2.7	7.6 ± 2.8	0.572
Added Sugar (0-10)	8.5 ± 2.3	8.0 ± 2.6	8.9 ± 2.1	0.173
Sodium (0-10)	8.0 ± 2.5	7.2 ± 2.8	8.4 ± 2.2	0.059
Saturated Fat (0-10)	3.3 ± 2.9	3.0 ± 3.0	3.6 ± 2.9	0.406
Fatty Acid (0-10)	1.4 ± 2.1	1.5 ± 1.8	1.4 ± 2.4	0.146

Table 3. Significant values observed in diet quality scores of Irish adults with CF above and below a BMI of 25 kg/m ²			
Diet Quality Measure	<25 kg/m ²	≥25 kg/m ²	p-value
HEI-2020			
Saturated Fat (0-10)	2.7 ± 2.7	4.3 ± 2.9	0.024
DQI-I			
Empty Calorie (0-6)	1.0 ± 1.9	0.1 ± 0.6	0.036

Values in tables 1, 2 and 3 are represented as mean ± standard deviation. Abbreviation(s): FEV₁ %, Forced expiratory value as a percentage predicted

CONCLUSION

It is evident that the overall **diet quality** of Irish adults with CF is **suboptimal** compared to specific index evaluation criteria (poor diet quality indicated by: HEI-2020 = 0-59; DQI-I = <60). Furthermore, **%TE from fat, saturated fat, and sugar** exceed recommended amounts and **discretionary foods** are being **relied on heavily** to achieve energy targets. With **sustained intakes**, this dietary pattern **poses risk** for the onset of **diet-related chronic diseases** like obesity, cardiovascular disease and type-II diabetes. **Next steps for clinical practice** and **CF-specific dietary guidelines** should be to address these issues through a **focus on improving diet quality**. **Future research** should endeavour to assess **interrelationship** between **diet quality** and **patient reported outcome measures** and collect **experiences** and **views** on nutrition in adults with CF to assess **drivers** of food and dietary choices, and **enablers** and **barriers** to dietary change. Contact: Audrey.Tierney@ul.ie Cian.Greaney@ul.ie

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