CoFID API

Technical Documentation

Version 2.2.0

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- **Contact Email:** fn-nbri@quadram.ac.uk
- **Base URL:** https://api.cofid.quadram.ac.uk/
- **Dataset:** McCance & Widdowson's Composition of Foods Integrated Dataset (CoFID) 2021
- **Date:** May 2026
- **Audience:** Developers, Integration Teams, Technical Reviewers

1. Overview

The Composition of Foods Integrated Dataset (CoFID) API provides structured, programmatic access to McCance & Widdowson's UK food composition data — the authoritative reference source for the nutritional composition of foods consumed in the United Kingdom.

The API was developed by the FN-NBRI Group and is designed to provide reliable, machine-readable access to UK nutritional reference data.

The API is accessible at:

```
https://api.cofid.quadram.ac.uk/
```

Interactive API documentation (Swagger UI) is available at:

```
https://api.cofid.quadram.ac.uk/docs
```

1.1 Key Capabilities

Capability	Detail
Food search & retrieval	Search by name, browse by group, or retrieve by unique food code
Nutrient sub-resources	Access individual nutrient categories (vitamins, minerals, fatty acids, etc.) per food item
Nutrient ranking	Rank all foods by any nutrient value, ascending or descending
Bulk lookup	Retrieve multiple food records in a single API call
Year-range filtering	Filter foods by the year(s) their composition data was collected
Food group browsing	List and filter all 15 food groups
Full nutrient inventory	Enumerate all available nutrient fields across all categories
Full food detail	Retrieve a complete nutritional profile for any food item across all nutrient categories.
Nutrient range search	Find all foods where a nutrient falls within a defined minimum and maximum range

1.2 Dataset Summary

Attribute	Value
Dataset name	McCance & Widdowson's Composition of Foods Integrated Dataset (CoFID)
Edition	2021
Total food items	2,887
Food groups	15
Nutrient categories	12 (proximates, vitamins, minerals, SFA, MUFA, PUFA, phytosterols, organic acids, and fractions)

2. Authentication & Access

The CoFID API uses API key authentication to control access to protected endpoints. All data endpoints require a valid API key supplied via the X-API-Key HTTP request header. API keys are issued and managed by the FN-NBRI Group.

2.1 Obtaining an API Key

Access to the API is granted by contacting the FN-NBRI Group at fn-nbri@quadram.ac.uk. Upon approval, a unique API key is issued. Each key is associated with a registered email address and is subject to a rate limit (default: 1,000 requests per day).

2.2 Using Your API Key

Include your API key in every request to a protected endpoint using the following header:

```
X-API-Key: your_api_key_here
```

Example using cURL:

```
curl -X GET \
  "https://api.cofid.quadram.ac.uk/api/v1/foods" \
  -H "X-API-Key: your_api_key_here"
```

Example using Python:

```
import requests

headers = {"X-API-Key": "your_api_key_here"}
r = requests.get("https://api.cofid.quadram.ac.uk/api/v1/foods", headers=headers)
print(r.json())
```

2.3 Rate Limiting

Each API key is subject to a default rate limit of 1,000 requests per day. This ensures fair use across all registered consumers. Higher limits are available on request for research or high-volume use cases. When the rate limit is reached, the API returns an HTTP 429 response:

```
{
  "detail": "Rate limit exceeded"
}
```

To request a higher rate limit, please contact the FN-NBRI Group at fn-nbri@quadram.ac.uk.

2.4 Unauthenticated Endpoints

The following endpoints are publicly accessible without an API key:

Endpoint	Description
GET /health	Returns the current API health status and version
GET /api/v1/version	Returns the API version and dataset statistics

3. Base URL & Versioning

All API requests are made to the following base URL:

```
https://api.cofid.quadram.ac.uk/
```

The API uses URL-based versioning. All data endpoints are prefixed with /api/v1/, clearly distinguishing the current version from any future versions. This ensures that integrations built against v1 continue to function without modification when future API versions are introduced.

3.1 Access Points

Resource	URL
Public API	https://api.cofid.quadram.ac.uk/
Interactive Documentation	https://api.cofid.quadram.ac.uk/docs
Health Check	https://api.cofid.quadram.ac.uk/health
Version Info	https://api.cofid.quadram.ac.uk/api/v1/version

4. Endpoint Reference

The CoFID API provides 23 endpoints across five functional areas. The table below summarises all available endpoints.

4.1 Utility Endpoints

Method	Endpoint	Auth Required	Description
GET	/health	No	System health status, API version, and food count
GET	/api/v1/version	No	API version and dataset totals

4.2 Food Endpoints

Method	Endpoint	Auth Required	Description
GET	/api/v1/foods	Yes	Paginated list of all foods. Supports filtering by food group.
GET	/api/v1/foods/search	Yes	Search foods by name. Supports filtering by group.
GET	/api/v1/foods/by-year-range	Yes	Filter foods by data collection year range.
GET	/api/v1/foods/{food_code}	Yes	Full food record including all nutrient categories.

Method	Endpoint	Auth Required	Description
POST	/api/v1/foods/bulk	Yes	Retrieve multiple food records by food code list.

4.3 Nutrient Sub-Resource Endpoints

Each nutrient category is accessible as a sub-resource of a specific food item. All endpoints follow the pattern GET /api/v1/foods/{food_code}/{category} and require API key authentication.

Endpoint	Nutrient Category
/api/v1/foods/{food_code}/proximates	Macronutrients: energy, protein, fat, carbohydrate, fibre, water, alcohol
/api/v1/foods/{food_code}/inorganics	Minerals: calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, copper, manganese, selenium, iodine
/api/v1/foods/{food_code}/vitamins	Vitamins: retinol, carotene, vitamin D, vitamin E, thiamin, riboflavin, niacin, vitamin B6, B12, folate, pantothenate, biotin, vitamin C
/api/v1/foods/{food_code}/vitamin-fractions	Vitamin sub-fractions and derived values
/api/v1/foods/{food_code}/sfa-per-100g-fa	Saturated fatty acids per 100g total fatty acids
/api/v1/foods/{food_code}/sfa-per-100g-food	Saturated fatty acids per 100g food
/api/v1/foods/{food_code}/mufa-per-100g-fa	Monounsaturated fatty acids per 100g total fatty acids
/api/v1/foods/{food_code}/mufa-per-100g-food	Monounsaturated fatty acids per 100g food
/api/v1/foods/{food_code}/pufa-per-100g-fa	Polyunsaturated fatty acids per 100g total fatty acids
/api/v1/foods/{food_code}/pufa-per-100g-food	Polyunsaturated fatty acids per 100g food
/api/v1/foods/{food_code}/phytosterols	Phytosterol content
/api/v1/foods/{food_code}/organic-acids	Organic acid content

4.4 Group, Nutrient & Ranking Endpoints

Method	Endpoint	Auth Required	Description
GET	/api/v1/groups	Yes	List all 15 food groups with codes and descriptions
GET	/api/v1/nutrients	Yes	List all available nutrient fields across all categories
GET	/api/v1/nutrients/{nutrient_name}/ranking	Yes	Rank all foods by a nutrient value (ascending or descending)

Method	Endpoint	Auth Required	Description
GET	/api/v1/nutrients/{nutrient_name}/search	Yes	Filter foods matching a nutrient value range

5. Query Parameters

The following query parameters are supported across the API's collection and search endpoints:

Parameter	Type	Default	Applies To	Description
limit	integer	20	List, Search, Ranking	Maximum number of results to return
offset	integer	0	List, Search	Number of results to skip (for pagination)
group	string	—	List, Search	Filter results to a specific food group code
q	string	required	Search	Name search query string
start_year	integer	—	By Year Range	Earliest data collection year to include
end_year	integer	—	By Year Range	Latest data collection year to include
order	string	asc	Ranking	Sort direction: asc or desc

6. Response Format & Data Schemas

All API responses are returned as JSON (application/json). Response bodies are consistent in structure across all endpoints.

6.1 Health Check Response

```
GET https://api.cofid.quadram.ac.uk/health
```

```
{
  "status": "healthy",
  "api_version": "2.2.0",
  "total_foods": 2887
}
```

6.2 List Foods Response

```
GET https://api.cofid.quadram.ac.uk/api/v1/foods?limit=2&group=M
```

```
{
  "total": 2887,
  "results": [
    { "food_code": "18-001", "food_name": "Chicken, breast, grilled", "group":
"M" },
    { "food_code": "18-002", "food_name": "Chicken, drumstick, roasted", "group":
"M" }
  ]
}
```

6.3 Food Detail Response

```
GET https://api.cofid.quadram.ac.uk/api/v1/foods/18-001
```

```
{
  "food_code": "18-001",
  "food_name": "Chicken, breast, grilled",
  "group": "M",
  "description": "Chicken breast, grilled without skin",
  "extracted_years": "2016,2019",
  "proximates": {
    "energy_kcal": 148,
    "protein": 32.0,
    "fat": 2.2,
    "carbohydrate": 0.0,
    "fibre": 0.0,
    "water": 65.5
  },
  "vitamins": { "vitamin_c": 0, "vitamin_d": 0.4, "thiamin": 0.11, ... },
  "inorganics": { "calcium": 11, "iron": 0.7, "zinc": 1.5, ... }
}
```

6.4 Search Response

```
GET https://api.cofid.quadram.ac.uk/api/v1/foods/search?q=salmon&limit=3
```

```
{
  "query": "salmon",
  "total_results": 12,
  "results": [
    { "food_code": "14-023", "food_name": "Salmon, Atlantic, raw", "group": "F"
},
    { "food_code": "14-024", "food_name": "Salmon, Atlantic, grilled", "group":
"F" },
    { "food_code": "14-025", "food_name": "Salmon, smoked", "group": "F" }
  ]
}
```

6.5 Bulk Lookup

```
POST https://api.cofid.quadram.ac.uk/api/v1/foods/bulk
Content-Type: application/json
```

```
Request body:
{ "food_codes": ["17-001", "18-001", "14-023"] }
```

6.6 Special Nutrient Values

Nutrient values in the dataset may be represented by the following special tokens in addition to standard numeric values:

Value	Meaning
null	Data not available or not measured for this food item
"Tr"	Trace — the nutrient is present but below the threshold of quantification
numeric	The measured value in the standard unit for that nutrient

7. Error Handling

The API uses standard HTTP status codes to communicate the outcome of every request. Error responses return a JSON body with a detail field describing the issue.

7.1 Error Response Format

```
{
  "detail": "Description of the error"
}
```

7.2 HTTP Status Codes

Status Code	Status	When Returned
200	OK	The request was successful and results are returned
400	Bad Request	A required parameter is missing or a parameter value is invalid
403	Forbidden	The API key is missing, invalid, or has been deactivated
404	Not Found	The requested food_code or resource does not exist in the dataset
429	Too Many Requests	The API key's rate limit has been exceeded for the current period
500	Internal Server Error	An unexpected server-side error occurred

8. Code Examples

8.1 Python — Search and Retrieve Nutrients

```
import requests

API_KEY = "your_api_key_here"
BASE_URL = "https://api.cofid.quadram.ac.uk"
headers = {"X-API-Key": API_KEY}

# Search for a food by name
r = requests.get(f"{BASE_URL}/api/v1/foods/search",
    headers=headers, params={"q": "salmon", "limit": 5})
results = r.json()
print(f"Found {results['total_results']} results")

# Retrieve full nutrient detail for the first result
food_code = results["results"][0]["food_code"]
detail = requests.get(f"{BASE_URL}/api/v1/foods/{food_code}",
    headers=headers).json()
print(detail["proximates"])
```

8.2 Python — Nutrient Ranking (Top 10 Foods by Vitamin C)

```
import requests

headers = {"X-API-Key": "your_api_key_here"}
BASE_URL = "https://api.cofid.quadram.ac.uk"

r = requests.get(f"{BASE_URL}/api/v1/nutrients/vitamin_c/ranking",
    headers=headers, params={"order": "desc", "limit": 10})
for item in r.json()["results"]:
    print(item["food_name"], ":", item["value"], "mg")
```

8.3 Python — Bulk Lookup

```
import requests

headers = {"X-API-Key": "your_api_key_here"}
BASE_URL = "https://api.cofid.quadram.ac.uk"

codes = ["17-001", "18-001", "14-023", "04-011"]
r = requests.post(f"{BASE_URL}/api/v1/foods/bulk",
    headers=headers,
    json={"food_codes": codes})
foods = r.json()
```

8.4 cURL — Get Proximates for a Specific Food

```
curl -X GET \
  "https://api.cofid.quadram.ac.uk/api/v1/foods/18-001/proximates" \
  -H "X-API-Key: your_api_key_here"
```

8.5 cURL — Search with Group Filter

```
curl -X GET \
  "https://api.cofid.quadram.ac.uk/api/v1/foods/search?q=milk&group=D&limit=10" \
  -H "X-API-Key: your_api_key_here"
```

9. Security & Compliance

The CoFID API has been designed and implemented with security and good practice principles at its core. The following section describes the security measures and compliance features built into the system.

9.1 Transport Security

All API communications are served exclusively over HTTPS (TLS).

9.2 Authentication & Access Control

Access to data endpoints is protected by API key authentication. Keys are issued only to registered users and can be deactivated by the FN-NBRI Group if required. The API enforces:

- Per-key rate limiting to prevent abuse and ensure fair access for all consumers
- Immediate key deactivation capability to respond to suspected compromise
- Administrative role separation — system management functions are entirely isolated from the public API

9.3 Dataset Licence

The CoFID API and the data it serves are licensed under the **Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International Licence (CC BY-NC-SA 4.0)**. The full licence text is available at:

```
https://creativecommons.org/licenses/by-nc-sa/4.0/
```

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10. Food Group Reference

The CoFID dataset organises foods into 15 groups, each identified by a single-character code. The group parameter in list and search endpoints accepts these codes.

Group Code	Food Group Description
B	Beverages
C	Cereals and cereal products
D	Milk and milk products
E	Eggs
F	Fish and fish products
G	Fats and oils
M	Meat and meat products
N	Nuts and seeds
P	Puddings
Q	Miscellaneous foods
R	Soups, sauces and miscellaneous foods
S	Sugars, preserves and snacks
V	Vegetables, potatoes and savoury snacks
X	Fruit
Y	Legumes

11. Contact & Support

The CoFID API is developed and maintained by the FN-NBRI Group. For enquiries regarding:

- API key registration and access requests
- Rate limit adjustments for research or high-volume use cases
- Technical integration support
- Dataset licensing and usage rights
- Reporting issues or unexpected API behaviour

Please contact the FN-NBRI Group directly at Quadram Institute Bioscience, Norwich.

Email: fn-nbri@quadram.ac.uk. Interactive API documentation and endpoint testing is available via the Swagger UI at:

```
https://api.cofid.quadram.ac.uk/docs
```