

# Development of a tool to assess the compliance of canteen menus with the Mediterranean Diet

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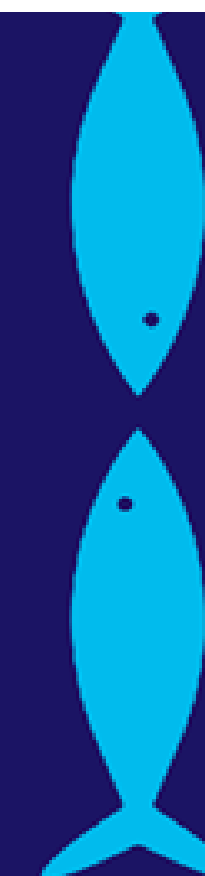
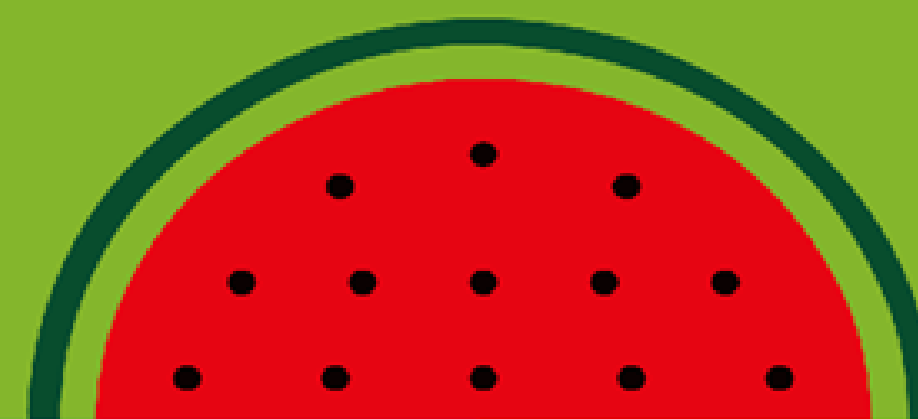
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EAT LOCAL  
EAT SEASONAL  
EAT REAL



**MEDDiET**  
- MENUS 4 CAMPUS -

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# The Mediterranean Diet

A sustainable and healthy food pattern

- ✓ One of the healthiest and most sustainable food patterns
- ✓ Alignment of dietary patterns with the MD with the development of compliance indexes
- ✓ Few menu assessment and individual adherence - criteria included lacking uniformity

Grosso G et al. 2017; Nissensohn M et al 2016; Petersson SD et al 2016; Trichopolou A. Et al 2004; Serra-Majem L et al 2020








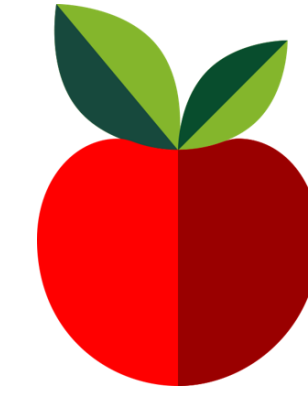
# Development of the Index

Literature review



-  MD key principles
-  Existing indexes on individual adherence to the MD
-  Existing indexes of menu assessment

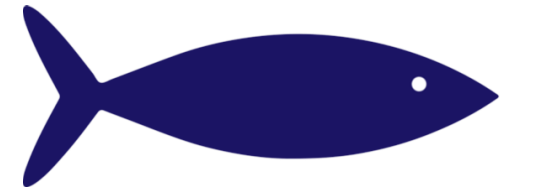




# 1. Mediterranean Key points

- **Local and seasonal foods, vegetables, whole grains, pulses, fruit, nuts, seeds, herbs and spices, fish over meat, lean meat over red and processed meats, eggs** as a good source of protein, olive oil as the preferred fat, monounsaturated fats over saturated fats, cholesterol and free sugars, fiber
- Typical Mediterranean dishes
- Sweet desserts and beverages
- Wine and dairy not included

## 2. Indexes of individual adherence to the MD



- Authors considered different parts to create our index  
→ PREDIMED, MDS, MEDAS, Med-DQI, MedDiet Score, SMDQ
- Indexes to evaluate specific eating habits or to assess health risk associated with food intake
- Based on the recommendations of the MD Pyramid

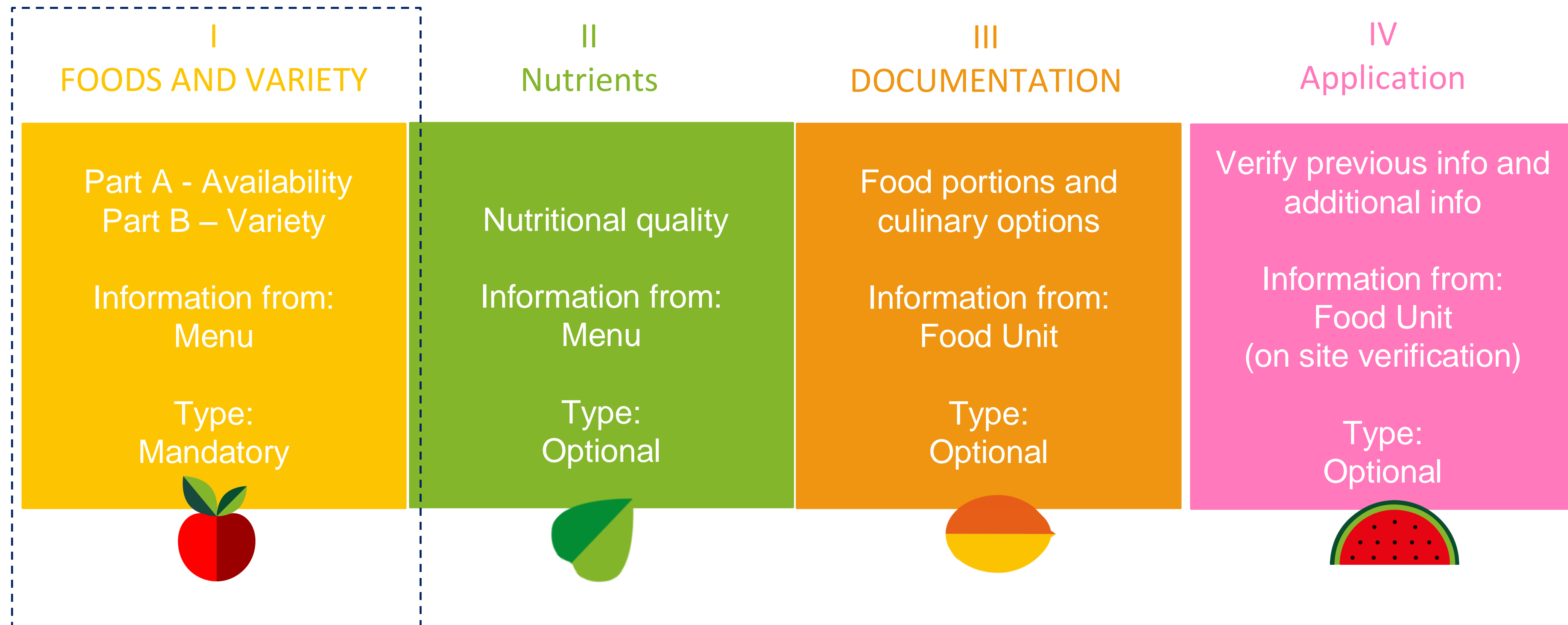
# 3. Indexes of menu Assessment



- Not related directly to the MD but the components were considered to create our index
- Such as MAST, FRESH, KIMEHS, AVACARD, NEMS-R → KIMEHS – for **children** only
- **Relevant** tool that **fills a gap** in menus assessment specific for MD – broader for all type of menus or age groups



Nutritionists and food service technicians





# DIMENSION I FOODS AND VARIETY

## IA – FOODS

## IB – VARIETY

QA1 Availability of traditional Mediterranean dishes

QB1 Stewed dishes with tomato and/or onion and/or garlic and/or leek at least 3 times a week

QA2 Availability of vegetables soup

QB2 Traditional soups of the MD (vegetables soup, use of pulses in some soups) **at least 3 or 4 times a week**

QA3 Availability of non-starchy vegetables (side dish or on dish)

QB31 **More than 1 variety** daily and **not repeated in consecutive** days

QB32 **More than 1 variety** daily and **not repeated in three consecutive** days different in at least 3 week days

QA4 Availability of seafood dishes

QB4 **Higher** number of fish than meat dishes

QA5 Availability of dishes with eggs as the main protein source

QB5 Dishes with eggs as the main protein source **at least once a week**

QB61 Lean meat dishes in a **higher** number than red meat dishes

12 items  
Focus on  
foods  
available



10 items  
Focus on  
the variety  
of foods  
available



Frequency



**Points range between -2 and 3 (according to importance in the MD)**

- Positive points to MD compliance
- Negative points to non-compliance



**Difficult to assess**

QA6 Availability of meat dishes

QB62 **No use** of processed meat

QB63 Use of processed meat dishes **no more than once a week**

QA7 Availability of dishes containing pulses

QB71 Pulses – 1 to 2 times a week

QB72 Pulses – 3 or more times a week

QA8 Availability of fresh fruit as dessert

QB81 Fresh Fruit – **Daily**

QB82 Fresh Fruit – **3 to 4 times a week**

QB83 Fresh Fruit – **1 to 2 times a week**

QB84 Sweet desserts **no more than 3 times per month**

QB85 Sweet desserts **no more than once a week**

QB86 Sweet desserts **2 to 3 times / week**

QB87 Sweet desserts **more than 3 times / week**

QA9 Availability of whole grains

QB9 Whole grains – **2 or more times a week**

QA10 Availability of nuts and seeds (in dishes or salads)

QB10 Nuts and seeds (in dishes or salads) – **once or more a week**

QA11 Availability of olive oil (cooking and seasoning)

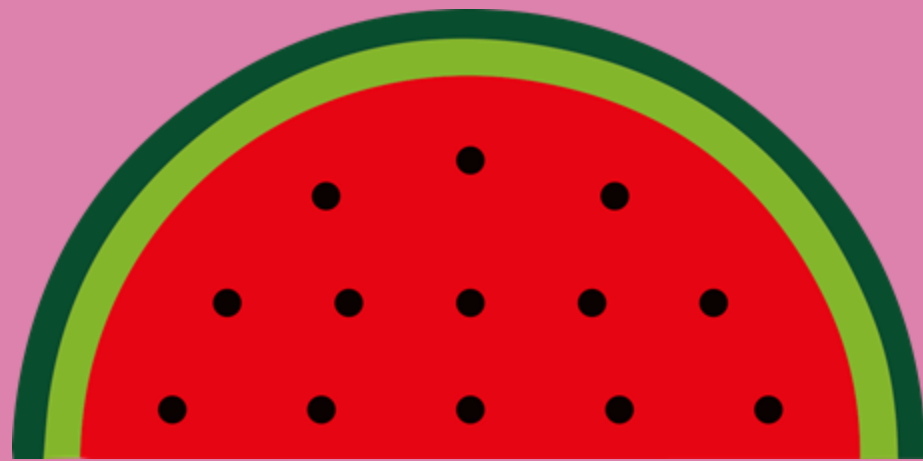
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QA12 Use of seasonal products

– –

# How to apply MeDCIn

1. **4-week** period – 5 days a week with 1 meal per day (lunch or dinner)
2. Answers: **YES (1)** or **NO (0)**
3. Questions 9, 11 and 12 allow for **Not Applicable (NA) = 99**
4. Questions should **not be left unanswered** (if so, score will not be calculated)



Evaluate all options  
except for **vegetarian**  
or other that restrict the  
offer (diet)



Weekly criteria → **1 week  
of noncompliance**  
enough not to score



# Applicability of MeDCIn

**60** menus

n = **14** Higher education cafeterias + **25** undergraduate schools +

**18** nursing homes + **3** private sector

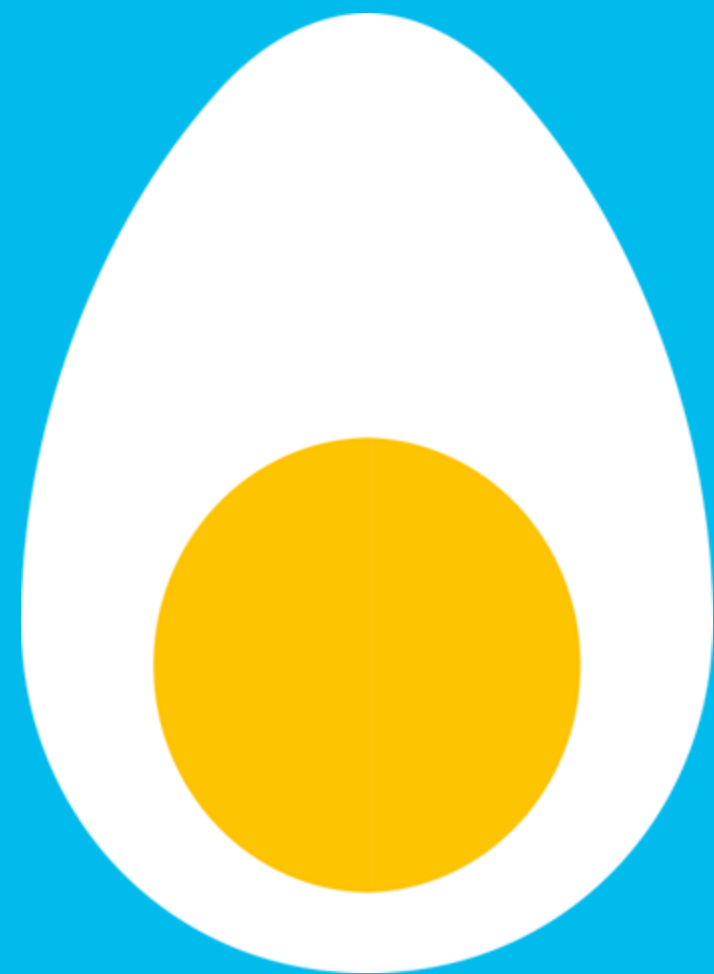


**Pilot assessment:** **2** researchers  
applied the index



**High** internal consistency (alpha-Cronbach coefficient = 0.88)

**High** inter-rater reliability (Cohen's Kappa agreement = 0.92)



# Results

Menus showed **low agreement** with the MD (ranging from -7 to 13.5 with an average of  $4.65 \pm 4.2$ )

## IA Availability

**Showed a moderate availability**  
of MD foods  
(scores [1.0 and 7.0] Mean  $4.87 \pm 1.2$ )

## IB Variety

**Showed a low variety** with:  
↑ frequency limited foods  
↓ frequency of key foods  
(scores [-8.0 and 6.5] Mean  $0.22 \pm 3.4$ )



# Results

Dimension I is **more influenced** by subdimension IB ( $r=0,97$ )

## IA Availability

Items with **strongest** correlation:

### Availability of

- fresh fruit ( $r=0,73$ ) ←
- non-starchy vegetables ( $r=0,59$ )
- dishes with egg ( $r=0,5$ )

## IB Variety

Item with **strongest** correlation:

### Offer of

- fresh fruit ( $r=0,72$ ) ←
- use of processed meats ( $r=0,52$ )
- sweet deserts ( $r=0,51$ )
- seafood dishes higher number than meat dishes ( $r=0,48$ )

# Discussion

## Subdimension IA

- **Fresh fruit** → Strongest positive correlation reflects the importance on a healthy diet but also seasonality and variety (future improvement)
- **Non-starchy vegetables** → Positive impact – higher points to higher frequency emphasize their importance and variety in the menus
- **Dishes with eggs** → Positive influence – often underrepresented on menus and should be promoted as a rich protein source





# Discussion

## Subdimension IB

- Apart from Fruit again as the strongest correlation
- **Processed meats** → impact on the score - less frequency higher points - raise awareness to the importance of reduce the consumption
- **Sweet desserts** → moderate correlation – less frequency higher points – promote moderate consumption
- **Seafood availability** → relevant correlation - was limited (higher number of meat dishes) reflecting the food patterns





# MEDDiET

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**Thank you for your  
attention**

**Further details and information:**



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**SCAN ME**

A green pea pod with three white peas inside, positioned at the bottom right of the slide.



# Acknowledgements

