14°
CONGRESSO NAZIONALE SINut

SINut

# EFFICACIA BIDIREZIONALE DI NUOVE MISCELE STANDARDIZZATE A BASE DI ESTRATTI VEGETALI NEL TRATTAMENTO DELL'IPERCOLESTEROLEMIA E NEL CONTROLLO DEL PESO

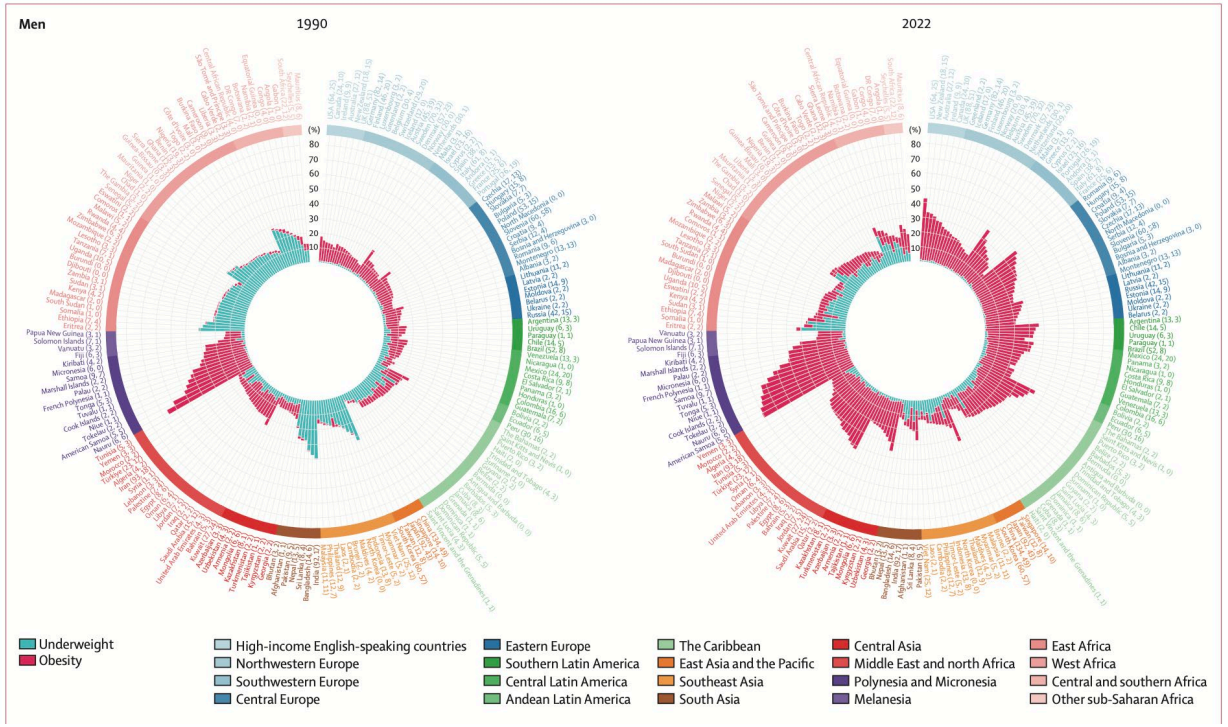
GIORDANO B. ZONZINI

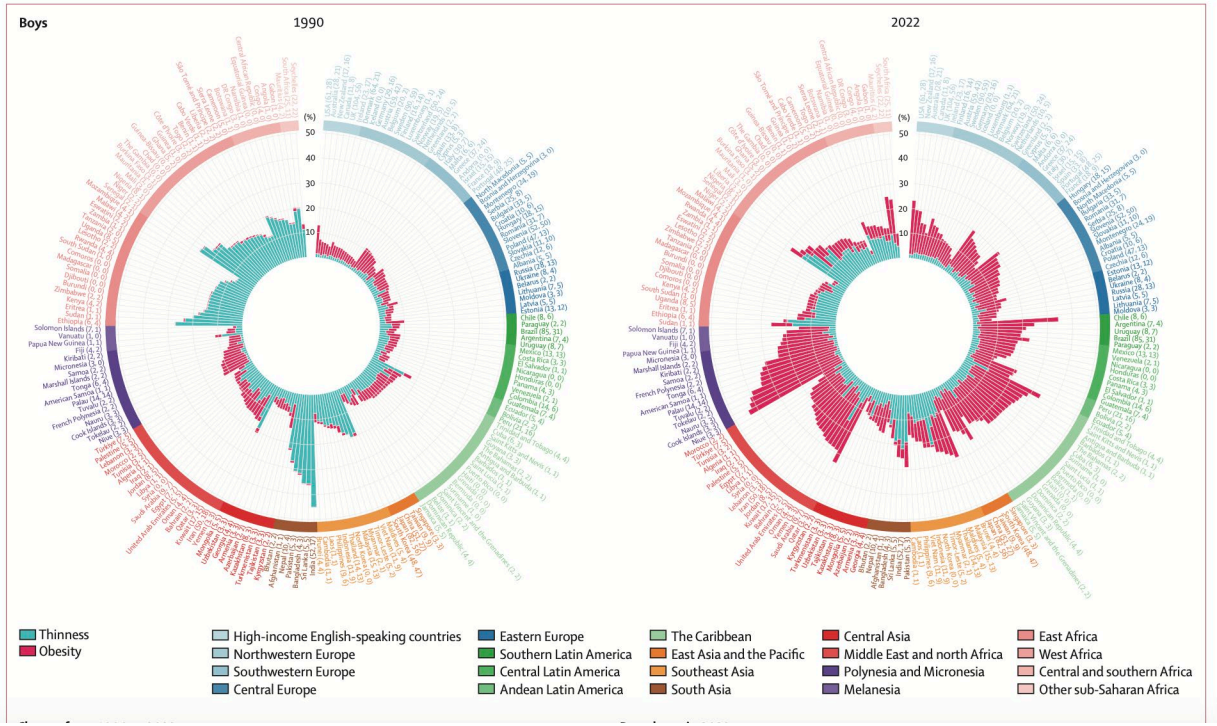
*Professore a c. – Università Degli Studi Di Urbino (DISB)*

*Nutrizionista*

*ESNS Fellow*

# EPIDEMIOLOGIA DELL'OBESITÀ: UNO SPUNTO DI RIFLESSIONE




Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults. *Lancet (London, England)*, *403*(10431), 1027–1050.

# GESTIONE NUTRIZIONALE DELL'OBESITÀ

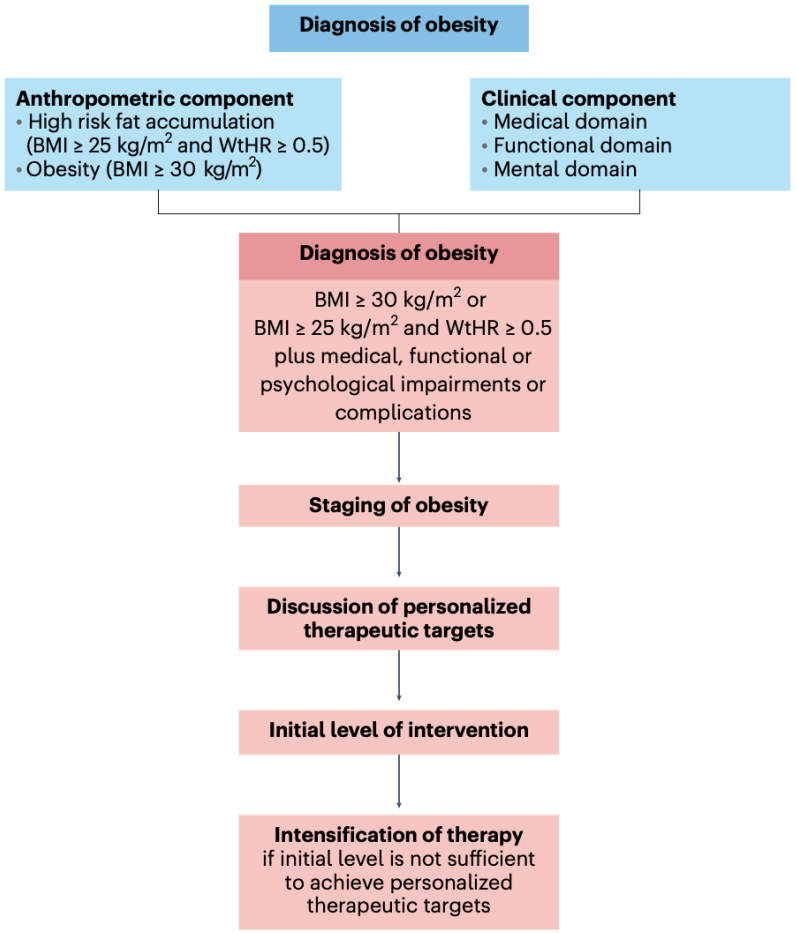
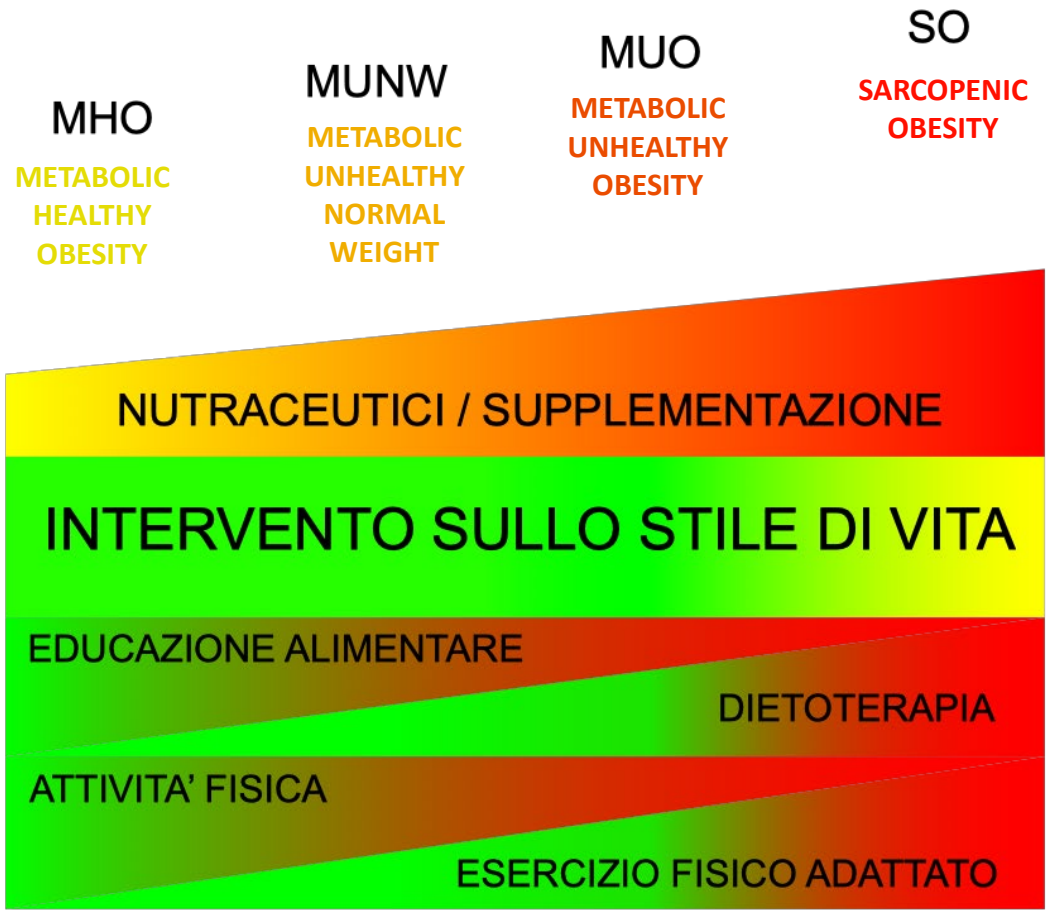


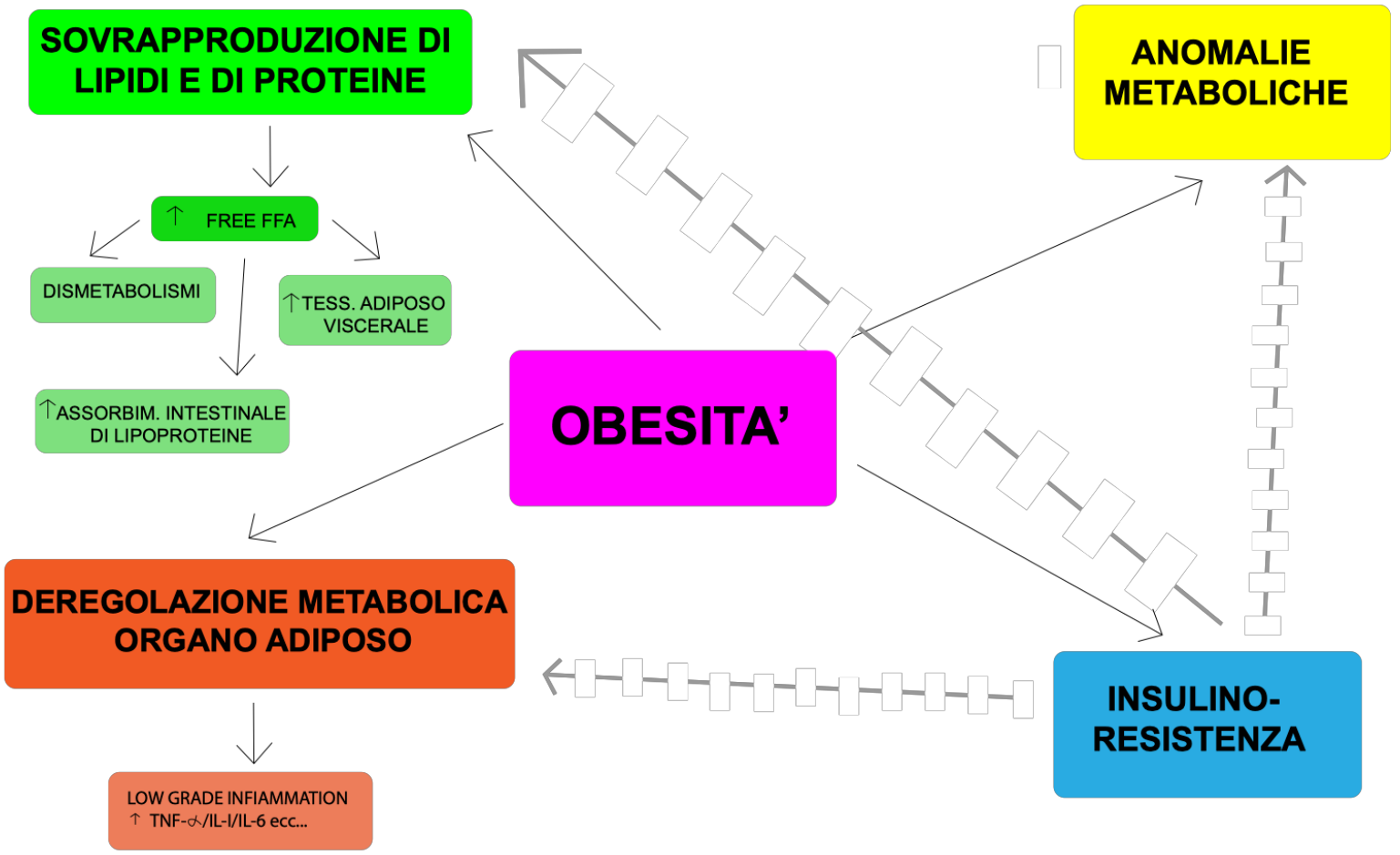

**Fig.1 A new framework for the diagnisis, staging and management of obesity in adults.**

Busetto, L., Dicker, D., Frühbeck, G., Halford, J. C. G., Sbraccia, P., Yumuk, V., & Goossens, G. H. (2024). A new framework for the diagnosis, staging and management of obesity in adults. *Nature medicine*, 10.1038/s41591-024-03095-3. Advance online publication. https://doi.org/10.1038/s41591-024-03095-3

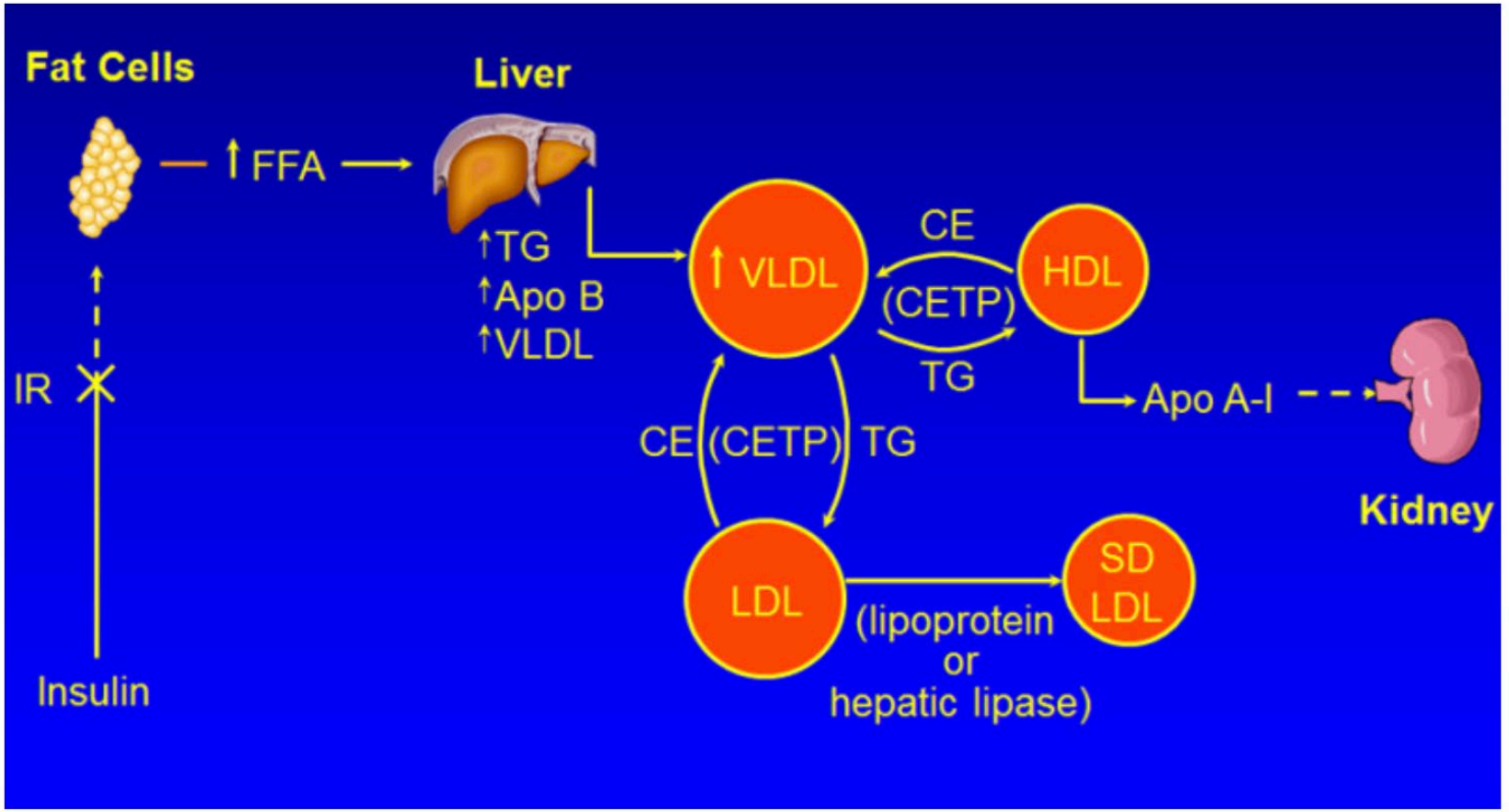
# GESTIONE NUTRIZIONALE DELL'OBESITÀ



# DISLIPIDEMIA E OBESITA'



# DISLIPIDEMIA E OBESITA'




Klop B, Elte JW, Cabezas MC. Dyslipidemia in obesity: mechanisms and potential targets. Nutrients. 2013 Apr 12;5(4):1218-40. doi: 10.3390/nu5041218. PMID: 23584084; PMCID: PMC3705344.

# NUOVA SFIDA



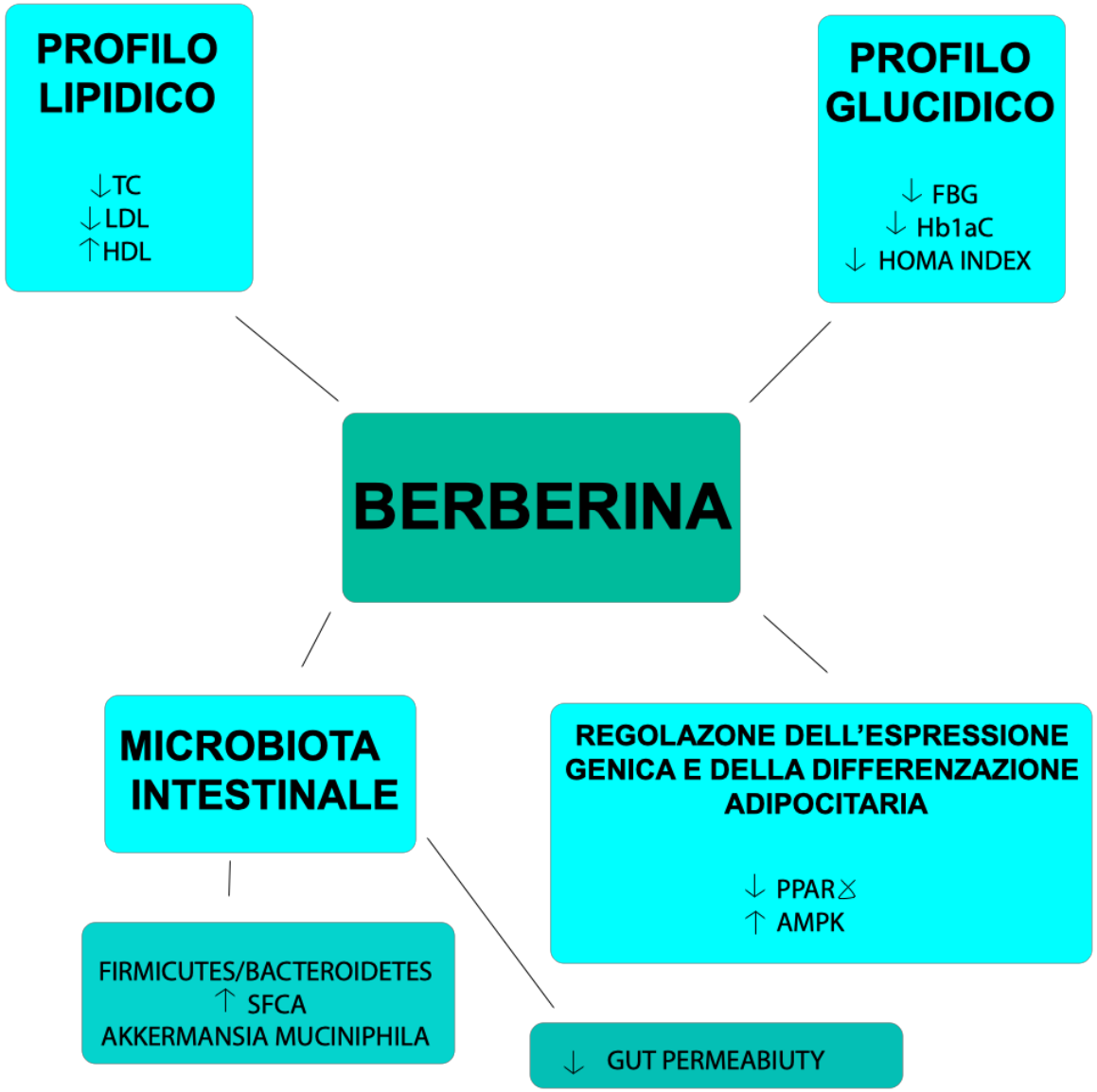
**REGOLAMENTO (UE) 2022/860 DELLA COMMISSIONE**

**del 1º giugno 2022**

**che modifica l'allegato III del regolamento (CE) n. 1925/2006 del Parlamento europeo e del Consiglio per quanto riguarda le monacoline da riso rosso fermentato**

The European Commission, (2022), COMMISSION REGULATION (EU) 2022/860 of 1 June 2022 amending Annex III to Regulation (EC) No 1925/2006 of the European Parliament and of the Council as regards monacolins from red yeast rice. Official Journal of the European Union.

# BERBERINA


PROFILO LIPIDICO
↓TC
↓LDL
↑HDL
PROFILO GLUCIDICO
↓ FBG
↓ Hb1aC
↓ HOMA INDEX
BERBERINA
MICROBIOTA INTESTINALE
FIRMICUTES/BACTEROIDETES
↑ SFCA
AKKERMANSIA MUCINIPHILA
REGOLAZONE DELL'ESPRESSIONE GENICA E DELLA DIFFERENZAZIONE ADIPOCITARIA
↓ PPARγ
↑ AMPK
↓ GUT PERMEABIUTY

# BERBERINA: PROFILO LIPIDICO

LA BERBERINA RIDUCE IL COLESTEROLO TOTALE (TC), LA COLESTEROLEMIA LDL (LDL-C) E AUMENTA
LA COLESTEROLEMIA HDL (HDL-C)

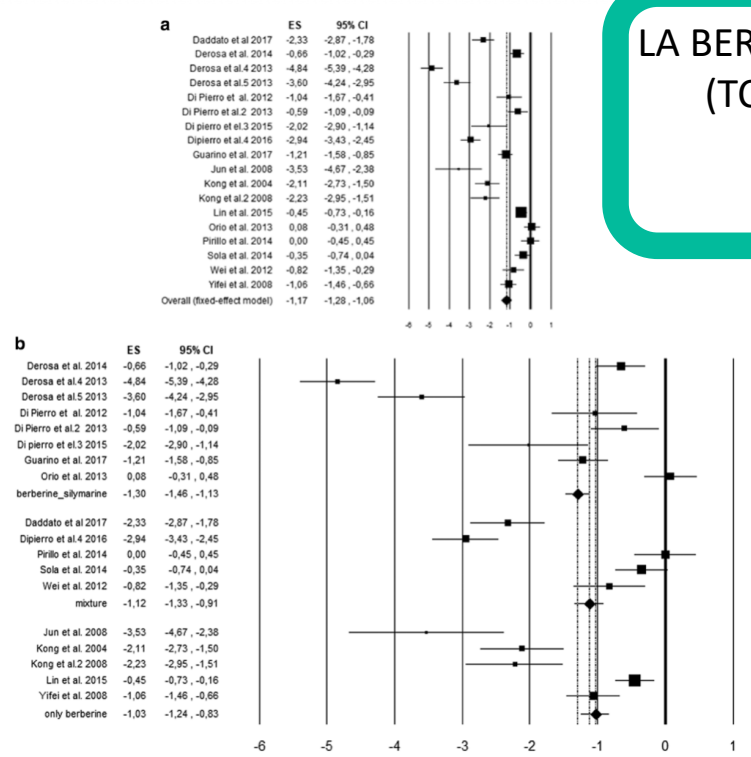



**FIG. 2**. Effects of berberine on total cholesterol overall (**a**) and according to formulations (**b**).

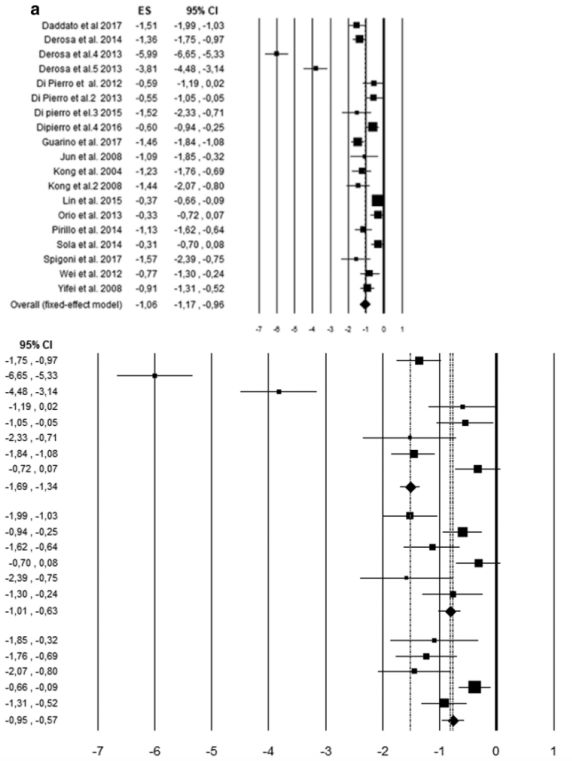



**FIG. 3**. Effects of berberine on low-density lipoprotein cholesterol; overall (**a**) and according to formulations (**b**).

# BERBERINA: PROFILO LIPIDICO

BERBERINA

- ↓ PCSK9
- ↑ LDL-R

# BERBERINA: PROFILO GLUCIDICO

Berberina riduce la glicemia a digiuno, l'emoglobina glicosilata (hb1ac), l'insulinemia e l'HOMA-IR

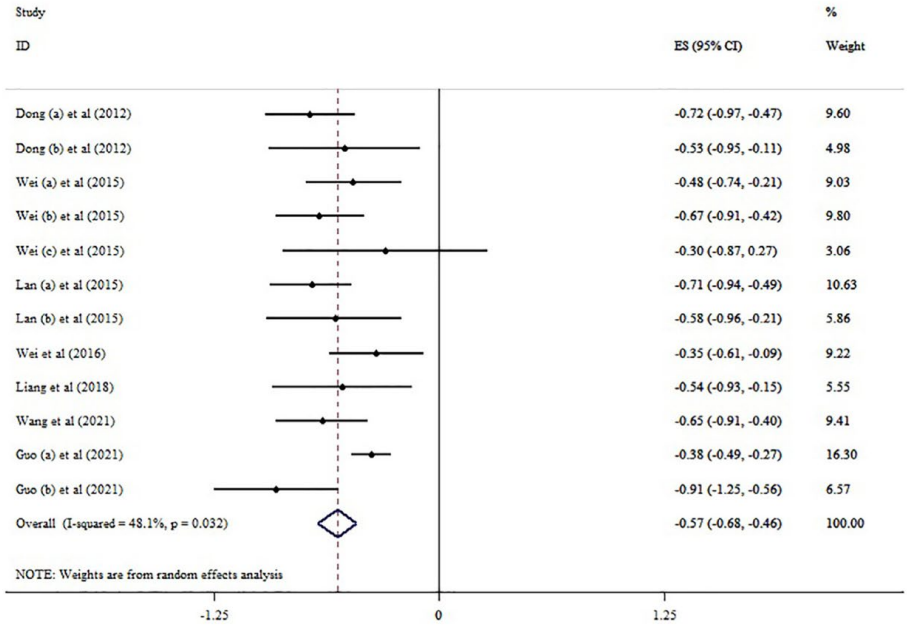



**Figure 3.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on HbA1c, according to WMD analysis.

**Figure 3.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on HbA1c, according to WMD analysis.

**Figure 4.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on HOMA-IR, according to WMD (A), and SMD (B) analysis.

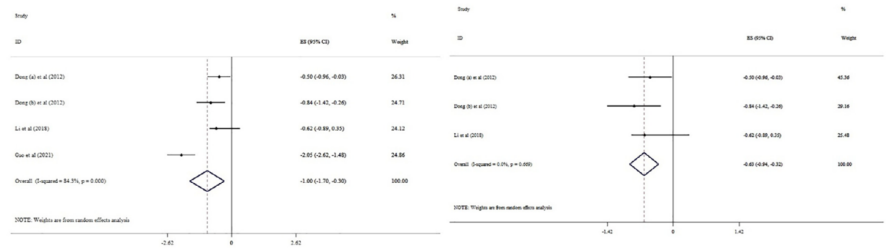
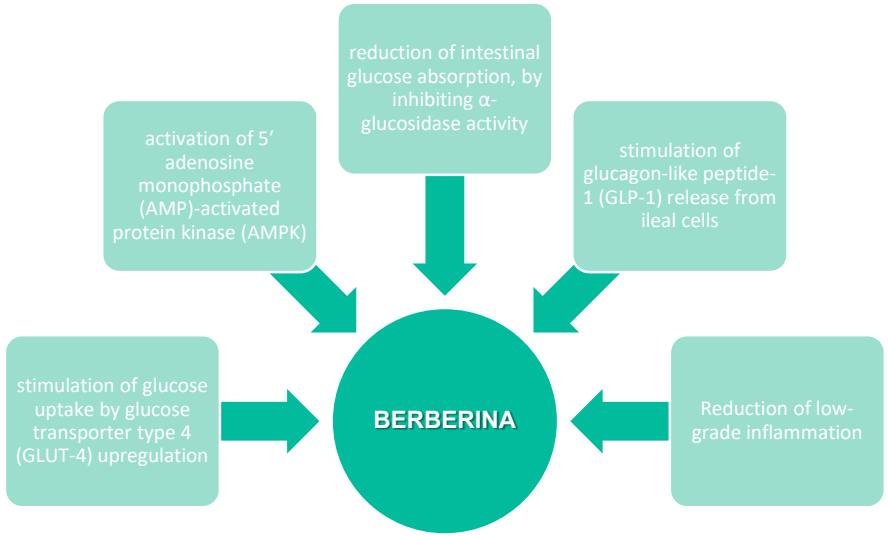


**Figure 5.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on insulin according to WMD (A), and SMD (B) analysis.


Nazari, A., Ghotbabadi, Z. R., Kazemi, K. S., Metghalchi, Y., Tavakoli, R., Rahimabadi, R. Z., & Ghaheri, M. (2024). The Effect of Berberine Supplementation on Glycemic Control and Inflam),matory Biomarkers in Metabolic Disorders: An Umbrella Meta-analysis of Randomized Controlled Trials. *Clinical therapeutics*, *46*(2 e64–e72. https://doi.org/10.1016/j.clinthera.2023.10.019

# BERBERINA: PROFILO GLUCIDICO





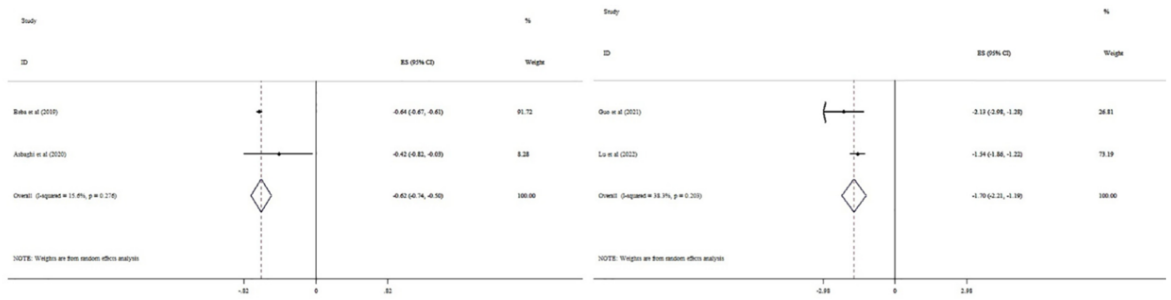
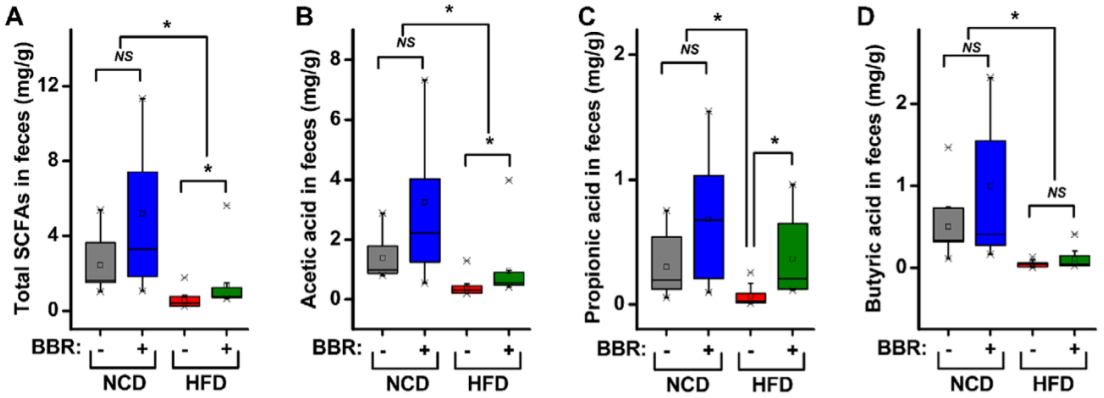



**Figure 6.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on CRP according to WMD (A), and SMD (B) analysis.

**Figure 7.** Forest plot with mean difference and 95% confidence intervals (CIs), the effects of BBR supplementation on TNF-a (A), and IL-6 (B) according to SMD analysis.

Nazari, A., Ghotbabadi, Z. R., Kazemi, K. S., Metghalchi, Y., Tavakoli, R., Rahimabadi, R. Z., & Ghaheri, M. (2024). The Effect of Berberine Supplementation on Glycemic Control and Inflammatory Biomarkers in Metabolic Disorders: An Umbrella Meta-analysis of Randomized Controlled Trials. *Clinical therapeutics*, *46*(2), e64–e72. https://doi.org/10.1016/j.clinthera.2023.10.019

# BERBERINA: MICROBIOTA INTESTINALE




Livelli di SFCA totali (A), acido acetico (B), acido propionico (C) e acido butirrico (D)

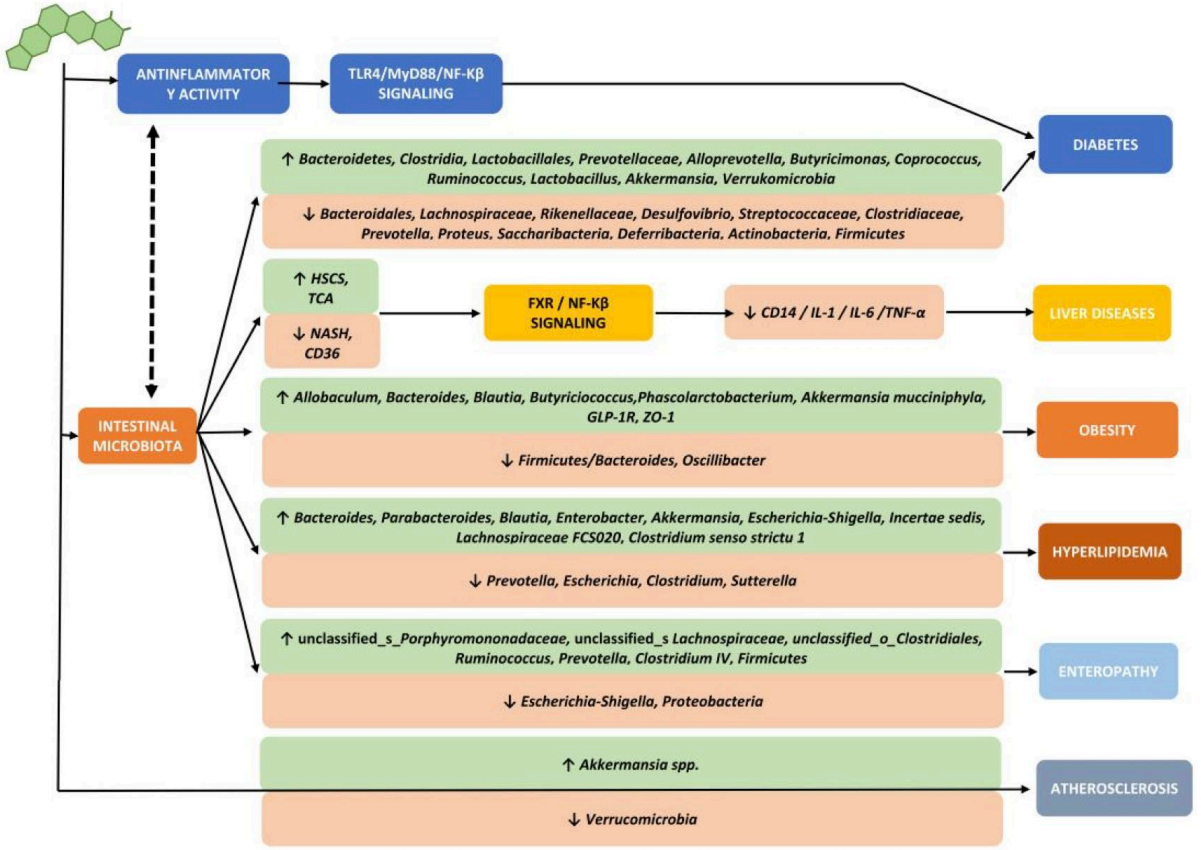


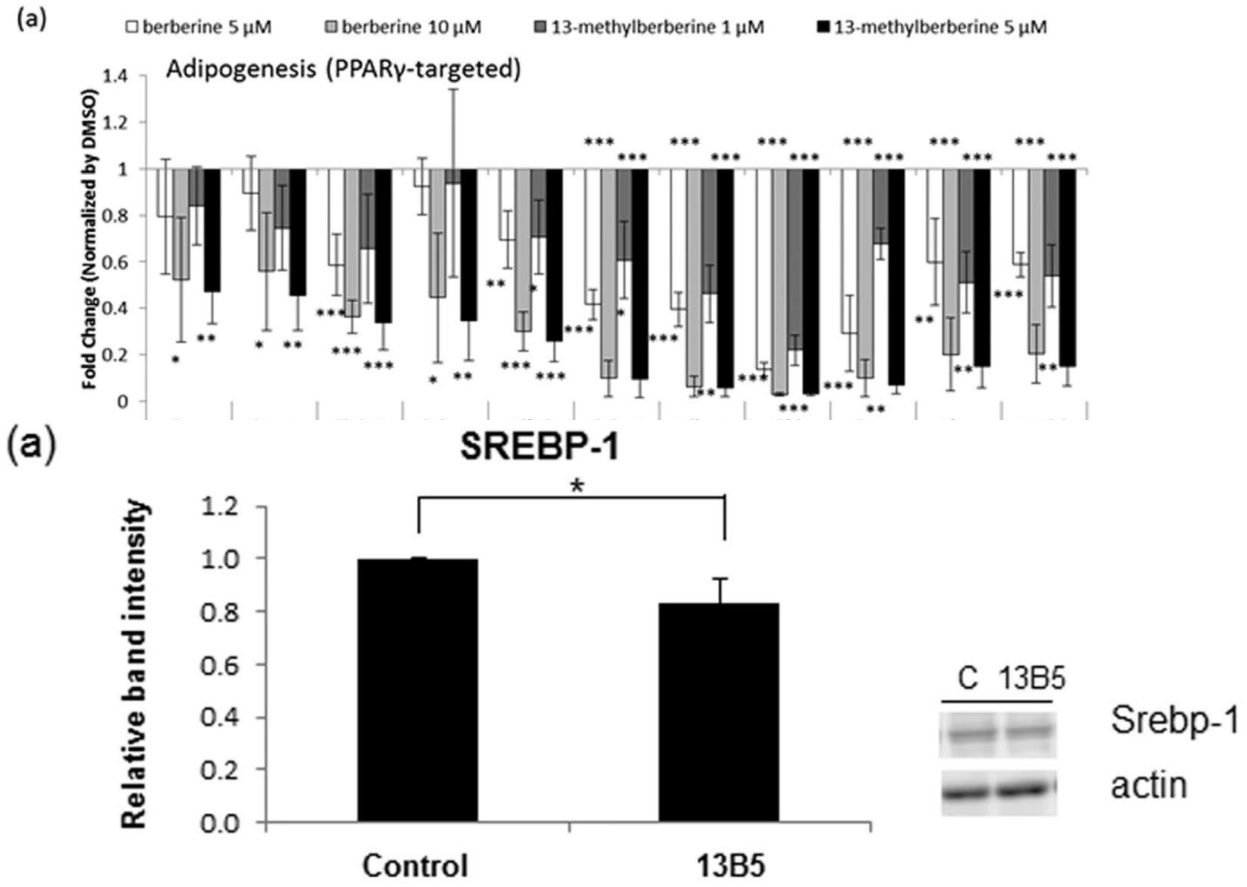

**Figure 5.** Main actions of berberine on the microbiota and metabolic diseases.

Zhang, X., Zhao, Y., Zhang, M., Pang, X., Xu, J., Kang, C., Li, M., Zhang, C., Zhang, Z., Zhang, Y., Li, X., Ning, G., & Zhao, L. (2012). Structural changes of gut microbiota during berberine-mediated prevention of obesity and insulin resistance in high-fat diet-fed rats. *PloS one*, *7*(8), e42529. https://doi.org/10.1371/journal.pone.0042529

# BERBERINA: ESPRESSIONE GENICA

BERBERINA

- ↓ PPAR-GAMMA
- ↓ SREBP-1
- ↑ AMP-K




Peng Z, Zhan H, Shao Y, Xiong Y, Zeng L, Zhang C, Liu Z, Huang Z, Su H, Yang Z. 13-Methylberberine improves endothelial dysfunction by inhibiting NLRP3 inflammasome activation via autophagy induction in human umbilical vein endothelial cells. Chin Med. 2020 Jan 22;15:8. doi: 10.1186/s13020-020-0286-1. PMID: 31993073; PMCID: PMC6977264.

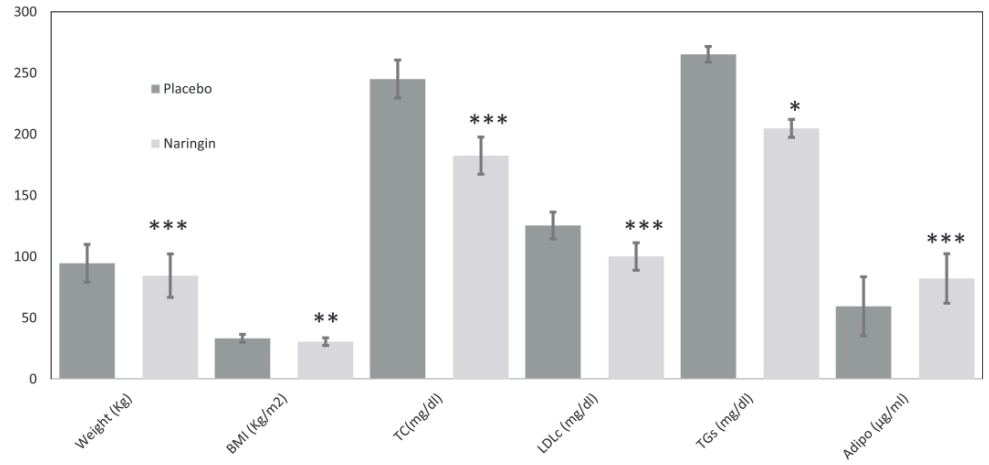
# NARINGINA NELL'OBESITA'

Naringina (450 mg) ha prodotto un miglioramento significativo del profilo lipidico ( TC, LDLc ) e un calo ponderale superiore rispetto all'assunzione di placebo.

**Table 2.** Comparison of the results intragroup in the placebo and naringin groups

| | Placebo | | | | Naringin | | | |
|---|---|---|---|---|---|---|---|---|
| | Basal | Final | | | Basal | Final | | |
| Measures | Mean ± SD | Mean ± SD | "δ" | *p*-value | Mean ± SD | Mean ± SD | "δ" | *p*-value |
| Weight (kg) | 94.5 ± 14.4 | 94.6 ± 15.4 | 0.06 | 0.97 | 89.6 ± 18 | 84.5 ± 17.8 | −5.1 | <0.001*** |
| BMI (kg/m$^2$) | 33.5 ± 2.94 | 33.3 ± 3.23 | −0.2 | 0.89 | 33 ± 2.89 | 30.6 ± 3.19 | −2.42 | <0.001*** |
| Waist C (cm) | 108 ± 14.1 | 106 ± 15.5 | −2.17 | 0.06 | 102 ± 13.6 | 98.7 ± 15.2 | −3.78 | <0.001*** |
| Hip C (cm) | 108 ± 9.95 | 107 ± 10.9 | −1.07 | 0.08 | 110 ± 9.57 | 106 ± 11.2 | −3.21 | 0.007** |
| Body fat (%) | 36.2 ± 4.55 | 32.7 ± 6.32 | −3.5 | 0.003** | 39.7 ± 4.10 | 33.8 ± 7.35 | −5.93 | 0.001** |
| Total cholesterol (mg/dl) | 222 ± 14.3 | 245 ± 24.1 | 23 | 0.002** | 217 ± 12.7 | 182 ± 20.2 | −35.4 | <0.001*** |
| Cholesterol HDL (mg/dl) | 40.7 ± 4.85 | 40 ± 5.68 | −0.71 | 0.64 | 43.4 ± 8.09 | 45.1 ± 10 | 1.71 | 0.53 |
| Cholesterol LDL (mg/dl) | 117 ± 28.2 | 125 ± 38.3 | 7.75 | 0.73 | 135 ± 18.3 | 100 ± 17.5 | −34.9 | <0.001*** |
| Triglycerides (mg/dl) | 232 ± 70.9 | 265 ± 106 | 33.5 | 0.035* | 217 ± 82.2 | 204 ± 78.3 | −12.3 | 0.41 |
| Adiponectin (µg/ml) | 0.77 ± 0.18 | 0.56 ± 0.19 | −0.15 | 0.002** | 0.72 ± 0.18 | 0.82 ± 0.25 | 0.09 | 0.09 |

The comparison between the baseline values and the values obtained after the use of placebo or naringin for 90 days are shown. Values are presented in mean and SD (standard deviation). "δ" were obtain from the difference of the basal vs final values. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. The Wilcoxon test for intra-group comparison was used.
BMI: body mass index; C: circumference; HDL: high-density lipoprotein; LDL: low-density lipoprotein.

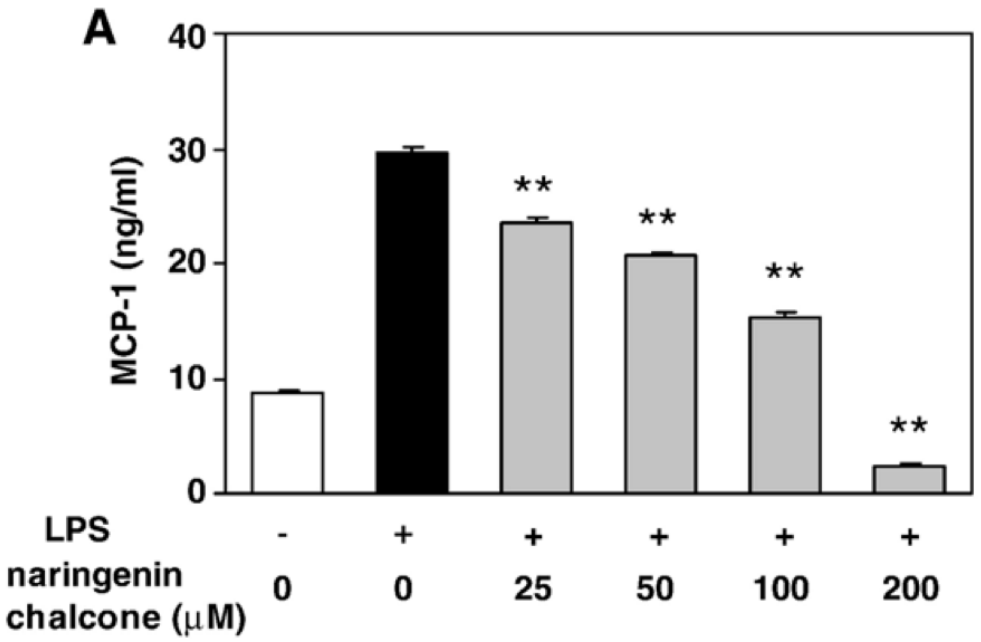


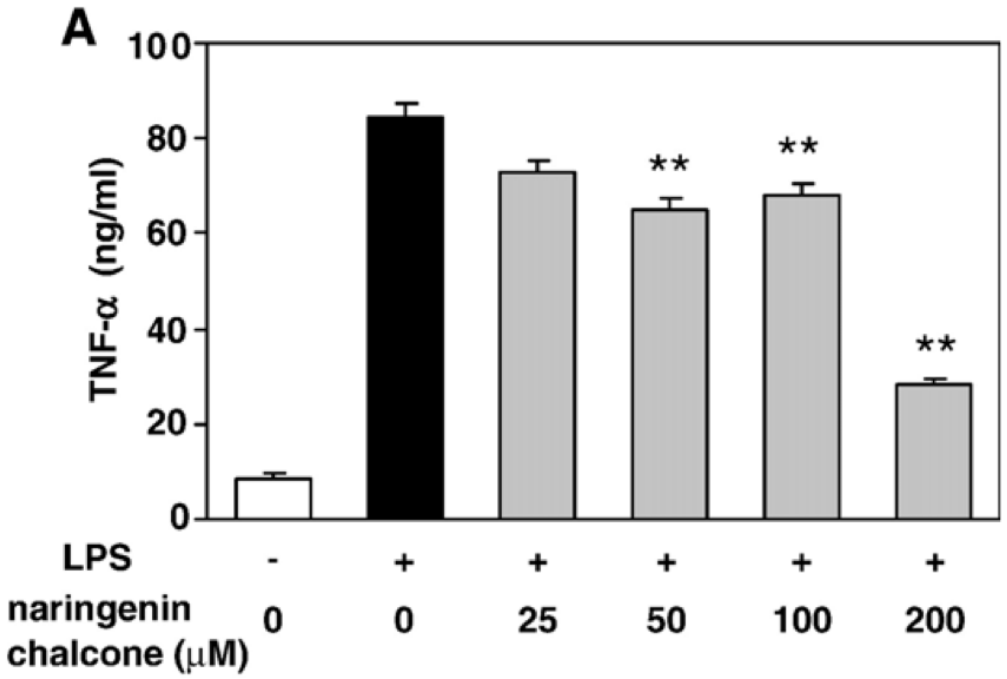

Comparison between the results after the 90-day intake of placebo against naringin. There are observed statistically significant anti-obesogenic and lipid-lowering effects.The values are presented in mean and SD, standard deviation.
*$p$<0.05, **$p$≤0.01, ***$p$<0.001. "$p$" results were obtained from the comparison of deltas "δ"; obtained from the difference of the basal vs final values. Mann-Withney U test was used. The adiponectin values were multiplied by 100 to achieve representativeness in the graph.
BMI: body mass index; TC: total cholesterol; c: cholesterol; TGs: triglycerides; Adipo: adiponectin.

**Figure 1.** Comparison of final values of naringin against placebo groups.

Barajas-Vega, J. L., Raffoul-Orozco, A. K., Hernandez-Molina, D., Ávila-González, A. E., García-Cobian, T. A., Rubio-Arellano, E. D., & Ramirez-Lizardo, E. J. (2022). Naringin reduces body weight, plasma lipids and increases adiponectin levels in patients with dyslipidemia. *International journal for vitamin and nutrition research. Internationale Zeitschrift fur Vitamin- und Ernahrungsforschung. Journal international de vitaminologie et de nutrition*, *92*(3-4), 292–298. https://doi.org/10.1024/0300-9831/a000658

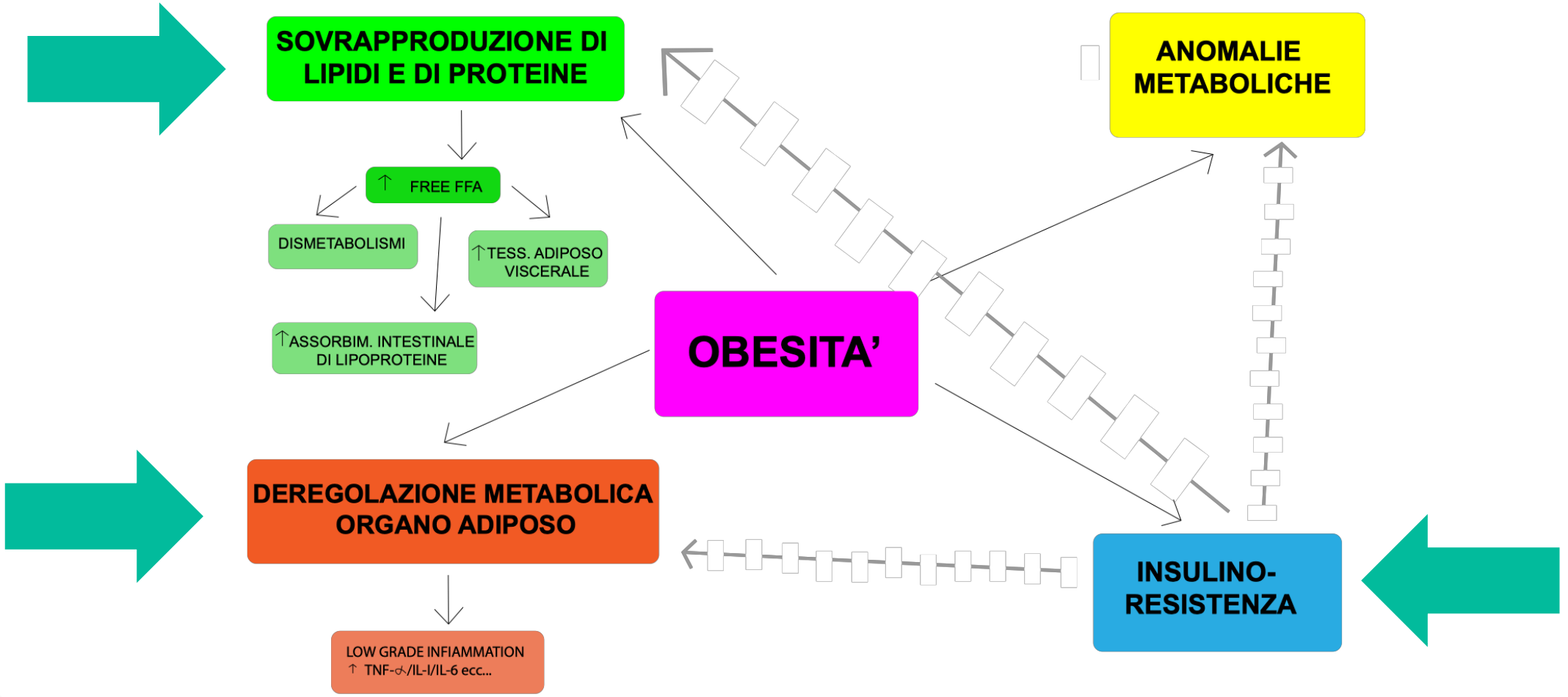
# NARINGINA E OBESITA'




Hirai, S., Kim, Y. I., Goto, T., Kang, M. S., Yoshimura, M., Obata, A., Yu, R., & Kawada, T. (2007). Inhibitory effect of naringenin chalcone on inflammatory changes in the interaction between adipocytes and macrophages. *Life sciences*, *81*(16), 1272–1279

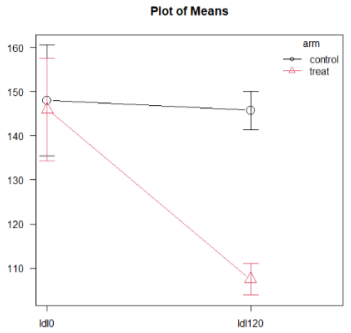
# DISLIPIDEMIA E OBESITA'

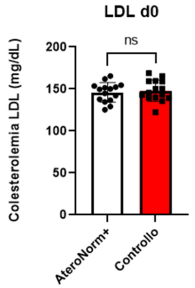


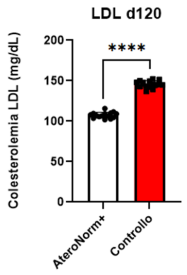
# EFFICACIA BIDIREZIONALE DI UNA MISCELA DI ESTRATTI VEGETALI

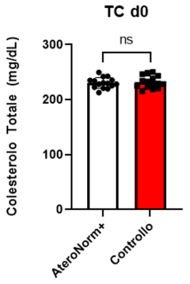
| | Untreated (%) | AN+ (%) | P-value |
|---|---|---|---|
| Day 0 | 148 ± 7.2 | 146 ± 6.7 | ns |
| Day 120 | 146 ± 2.5 | 108 ± 2.1 | P<0.001 |
| Variaz. Perc. | -1.6 | -26.3 | / |

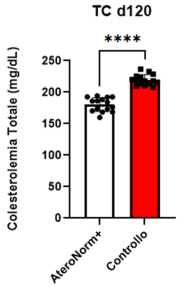
| | Untreated (%) | AN+ (%) | P-value |
|---|---|---|---|
| Day 0 | 232 ± 6.4 | 230 ± 5.61 | ns |
| Day 120 | 219 ± 4.91 | 180 ± 6.35 | P<0.001 |
| Variaz. Perc. | -5.4 | -21.7 | / |

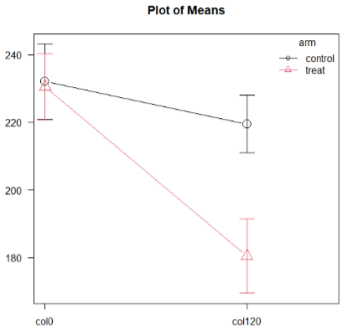


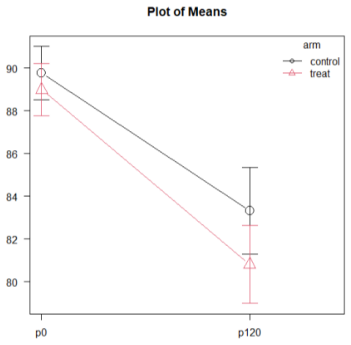



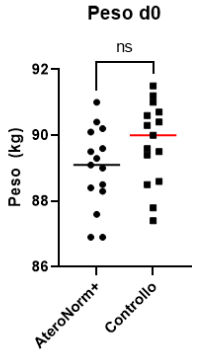



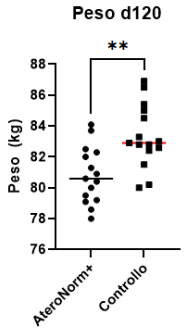
# EFFICACIA BIDIREZIONALE DI UNA MISCELA DI ESTRATTI VEGETALI

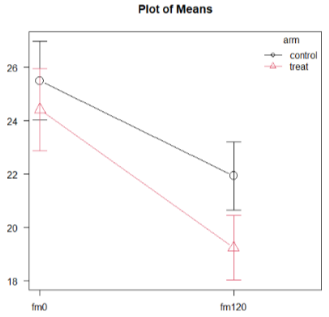
| | Untreated (%) | AN+ (%) | P-value |
|---|---|---|---|
| Day 0 | 89.7 ± 0.7 | 89.0 ± 0.7 | ns |
| Day 120 | 83.3 ± 1.17 | 80.8 ± 1.06 | P=0.001 |
| Variaz. Perc. | -7.2 | -9.2 | / |

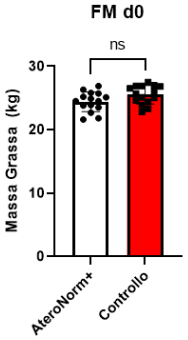
| | Untreated (%) | AN+ (%) | P-value |
|---|---|---|---|
| Day 0 | 25.5 ± 0.85 | 24.4 ± 0.9 | ns |
| Day 120 | 21.9 ± 0.74 | 19.2 ± 0.7 | P<0.001 |
| Variaz. Perc. | -14 | -21.2 | / |

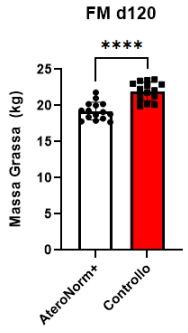


# NUTRACEUTICO

14°
CONGRESSO NAZIONALE SINut

SINut

# " COMBATTIAMO L'OBESITÀ E NON LE PERSONE CON OBESITÀ "

D. DI PAULI