PS10.03 **Towards an effective spreading of the nutritional value of meat based dishes. 329.00**

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Abstract— The book presented "Nutritional value of traditional Italian meat-based dishes" provides a picture of the compositional figure and nutritional value of meat based dishes typical of Italian culinary tradition. Recipes were selected among the most widespread ones in Italy. Total fat and cholesterol content varied depending on the ingredients utilised (extra-virgin olive oil, parmesan, egg). Meat based dishes which utilised extra-virgin olive oil showed a significant reduction in palmitic and stearic acids and a parallel increase in oleic acid compared to raw meat, furthermore the ratio among SFA, MUFA and PUFA shifted in favour of MUFA. B-vitamins were affected at different extent by heating, by contrast vitamin E content increased because of the richness of ingredients (olive oil) in this vitamin which masked losses due to heating. Ingredients (parmesan, discretionary salt) induced also significant increases in Ca and Na concentration compared to raw meat. Total iron content did not show marked differences in most of the meat based dishes compared to raw meat, by contrast losses in heme-iron concentration were detected depending on the severity of heating treatments. Our findings suggested that heme-iron, because of its important health aspects, might be a useful index of nutritional quality of cooked meats.

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Index Terms— meat-based dishes, fatty acids, cholesterol, heme-iron, minerals. vitamin E, B-vitamins.

I. INTRODUCTION

Meat represents an important part of the daily food consumption in developed countries. Data on the composition of the Italian Total Diet (1) reported an average daily intake of meat and meat products of 130.6 g/person/day. Bovine meat is the most consumed meat in Italy: it (beef plus veal) accounts for 39.4% of the total meat and meat products daily consumption (2). The increased awareness of the close relationship between food and health (3, 4) has led the interest of consumers towards the acquisition of more detailed information on quality characteristics of foods and also on their safety, with a clear demand to know the entire production chain of foods from farm to fork. The first step to meet these demands is to make available and easily accessible data on the composition of the foods which enter in the daily diet of consumers. Preparation and cooking methods of food, especially for complex meals, lead to a modification of its basic composition (5, 6). It may indeed occurr a loss in some nutrients induced by heat treatment, as well as a formation of new molecules coming from ingredients which make up the recipe. This leads to changes in the composition, information necessary for consumers or nutritionists for the formulation of balanced diets or special diets.

II. MATERIALS AND METHODS

Meat samples Steer and veal were reared in Italy and raised on commercial pellets (UNIFEED) a mixture of maize, wheat flour, hay, ensilage, and slaughtered conventionally at 21 months. The carcasses were prepared into retail cuts (fillet, sirloin-steak, eye-round, top-side, knuckle), trimmed away of external fat, packaged in vacuum pack and delivered to laboratory. In order to obtain representative meat samples for analyses, the meat cuts were subdivided in several equal aliquots: some aliquots were immediately taken for the analysis of raw meat, others were prepared to be cooked following a variey of recipes. Recipes The recipes utilised in this study were selected among those typical of the Italian culinary tradition (in pan, hamburger, pizzaiola, cutlet, meat ball, escalope, saltimbocca, broiled, roasted with bacon, fillet with green pepper, stew, vitel tonnè). After cooking the meat based dishes were homogenised and some aliquots were immediately analysed, the others were frozen at -30°C and stored for subsequent analyses, each being carried out in triplicate. Analyses Moisture,ash, protein: analyses were performed following the AOAC method (7). Lipid: Intramuscular fat was extracted by means of a modification of the method of Folch, et al. (8) using chloroform/methanol (2/1, v/v). Fatty acids: Fatty acids were esterified using boron trifluoride in methanol as esterification reagents (9). The esterified fatty acids were quantified by gas-chromatography (HP 5890 II series,equipped with FID). Cholesterol: cholesterol content in the samples was quantified by enzymatic assay (Boehringer Mannheim/R-Biopharm). Minerals: Samples were analysed for macro elements (Ca, Mg, Na, K, P) and trace elements (Fe, Zn, Cu, Mn) content. Aliquots of the samples were liquid ashed (4ml HNO_3+1ml H_2O_2) in a microwave digestion system. Analyses were performed by ICP-Plasma on a Perkin-Elmer (Norwalk, CT 06859, USA) Optima 3200XL. Standard Reference Material: Bovine muscle (BCR 184, Community Bureau of

Reference, Brussels) and Bovine liver (NBS 1577°; National Bureau of Standards, Gaithersburg, MD, USA) were analysed as a check on the accuracy of the analysis. Heme-iron: heme iron in the samples analysed was determined following the method described by Lombardi-Boccia et al. (10). B Vitamins: thiamine and riboflavin were separated and quantified by HPLC after acidic and enzymatic (Takadiastase) hydrolysis of the samples, following the procedure described by Arella et al. (11). Niacin was quantified following the method described by Lahély et al. (12). Vitamin E, t-retinol: were separated and quantified by HPLC following the method by Albalà-Hurtado et al. (13).

III. CONCLUSION

The book presented here, "Nutritional value of traditional Italian meat-based dishes", was designed to disclose in a clear but scientific way, experimental data of a study aimed to evaluate the composition and the nutritional value of a variety of culinary preparations based on bovine meat (beef and veal) selected among the most widespread Italian recipes (Tab.1). Data on macro-nutrients and micro-nutrients, heme iron, cholesterol and caloric value were reported, as well as informations on the influence of cooking methods and recipe formulation (ingredients) on the concentration in those molecules more susceptible to heating, such as vitamins and heme-iron. One of the nutritional strategies addressed to improve the knowledge of the cosumers on their daily food consumption should be to disseminate data on the nutritional composition of foods as daily consumed (in this case of meat-based dishes). The first step to meet this goal is to make available and easily accessible to consumers, as well as to the various stakeholders, data on the nutrient composition of foods, this will allow consumers to make more careful choices of foods that constitute the overall daily diet. Furthermore data on the composition of cooked foods can offer reliable information on nutrient intake and can represent a proper and useful tool to guide consumers and nutritionists in the formulation of more accurate diets. The knowledge of the changes occurring in foods after cooking, especially in micronutrients content, in fact allows a correct calculation of the actual nutrient intake at consumer level. Losses in nutrients during food preparation and cooking procedures can affect calculation of theoretical nutrient intake, therefore it is of importance to include in Food Composition Data Bases experimental values of nutrient and energy content of composite recipes, that is the way in which foods are generally consumed. Finally, some micronutrients can be used as a biochemical index predictive of the nutritional quality of cooked foods. In this study data on heme-iron content in meat based dishes pointed out that heme-iron concentration varied greatly among the recipes analysed and that the knowledge of the degree of heme-iron degradation in cooked meats is determinant for accurately predicting the level of iron availability.

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Recipes composition and cooking methods

In pan   (in padella)

I.   *INGREDIENTS:* **850 G MEAT.** *COOKING METHOD:* IN PAN, 3-5 MIN

A.   **Broiling (alla griglia)**

B.   Ingredients: *850 g meat.* Cooking method*: on grill, 6 min.*

C.   **Fillet with green pepper (filetto al pepe nero)**
Ingredients: 900 g meat, 30 g butter, 110 g cream, 5 g salt, 5 g green pepper, 100 ml brandy. *Cooking method*: in pan, 5min.

D.   **Roasted with bacon (arrosto)**
Ingredients: 510 g meat (fillet), 25 g bacon, 30 ml extra-virgin olive oil, 3 g rosemary, 2 g salt, 0.4 g black pepper. *Cooking method*: in pan*,* 10 min

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Cutlet (cotoletta)
Ingredients: 750 meat, 140g breadcrumb, 1 egg, 100 ml extra-virgin olive oil, 5g oreiganum, 5g salt. *Cooking method:* deep fried in pan, 6 min

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Hamburger
Ingredients: 830 g meat, 5 g salt. *Cooking method*: in pan, 10 min

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Escalope with white wine or lemon (scaloppina)
Ingredients: 850 g meat (top-side), 45 g wheat flour, 50 ml extra-virgin olive oil, 150 ml white wine, 5 g salt. *Cooking method*: in casserole, 10-15 min

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E.   **Saltimbocca roman style**
Ingredients: 450 g meat (top-side), 100 g ham, 25 g butter, 25 g wheat flour, 2.3 g salt, 0.3 g black pepper, 65 ml white wine, 4.5 g sauge (8 leaves). *Cooking method*: in casserole, 10-15 min

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Stew (*spezzatino)*
Ingredients: 1 kg carne, 15 g wheat flour, 1 onion, 30 ml extra virgin olive oil, 50 g butt, er 270 ml rewined , 6 g salt, 0,5 g black pepper. *Cooking method*: in casserole, 45 min

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Pizzaiola
Ingredients: 850 g meat (top-side), garlic (1clove), 410 g canned tomatoes, 50 ml extra-virgin olive oil, 5 g oregan, 5 g salt, 0,6 g black pepper. *Cooking method*: in pan*,* 10 min

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Meat ball (polpette)
Ingredients: 810 g meat, 2 eggs, 80 g parmesan, 170 g bread, 140 g breadcrumbs, garlic (1clove), 50 g wheat, 150 ml red wine, 85 ml extra-virgin olive oil, 5 g salt, 0,5 g black pepper. *Cooking method*: in casserole, 45 min

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Vitel tonnè
Ingredients: 600 g meat, 4 g salt. *Cooking method*: in casserole, 40 min.
Maionnaise sauce: 1 egg (60 g), 180 ml extra-virgin olive oil, 160 g canned tuna, 33 g capperi, 6 anchovies (7.5 g), 1.2 g salt, 20 g lemon juice.