



# PARMA HAM

Well-being and diet  
Nutritional values



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# INTRODUCTION

Nowadays we talk increasingly about *eating well* referring not just to good and tasty foods but to healthy foods as well, for a lifestyle based on a correct and balanced diet.

Genuineness, excellence and well-being are therefore extremely topical subjects able to attract interest in the scientific world in companies and institutions, among the media and consumers. And it is consumers who appear particularly careful about what they buy, who expect a clear and transparent message from the producing companies.

In the light of such a cultural change in purchasing behaviour with a much greater involvement of the consumer, the **Parma Ham Consortium** wanted to carry out research to update the nutritional values, working in agreement with the *Stazione Sperimentale per l'Industria delle Conserve Alimentari (SSICA)* (Experimental Station for the food Preserving Industry) and the *Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione (INRAN)* (National Food and Nutrition Research Institute).

This is an initiative that comes a few years after the publication of the previous data and its purpose is to adequately inform consumers to support them while buying and help them make informed choices, confident of offering at the same time a product with inherent guarantees of safety and reliability.



**Parma Ham is a PDO;** *Protected Designation of Origin* means a product that is controlled and protected by national and EU laws by virtue of its indivisible link with the geographical area whose name it bears. The producing companies associated with the **Parma Ham Consortium** work in full compliance with the strict rules set by the Production Specifications to safeguard the tradition and quality of a completely natural product that uses only Italian raw material and sea salt.

The analyses to update the nutritional values form part of a wider survey on the performance of the entire supply chain in order to program possible intervention action. This need arises from the wish to obtain objective confirmation of the work and commitment given by the producers, by the Consortium and by the controlling bodies, and to assess



# INTRODUCTION

how much these then manifest themselves as quality and nutritional properties in **Parma Ham**, which is a good, healthy food, as also shown by the most recent market research on how well the product is rated by consumers. High quality, organoleptic stability, unmistakable sweetness, a product of absolute excellence that summarizes and exalts the good characteristics of cured ham, from both the sensory and nutritional viewpoint.

A winning combination that finds confirmation in the measured improvement in nutritional values, which is partly due to an evolution in production: the selection of breeds with changes in the lipid composition of the pork meat; the progresses in feedstuff production and the control at all stages of the production chain that has enabled safe products with constant healthiness and quality characteristics to be obtained, not to mention the technological updating carried out by the producing companies.

Of the new elements present in the latest data, because they had not previously been analysed, it is worth mentioning the good amount of natural antioxidants contained in **Parma Ham**. Vitamin E and selenium, for example, are substances that have the ability to inhibit the action of free radicals, the main cause of aging and degenerative diseases, and restore the physiological balance of the body. The considerably reduced salt content also emerges, and this is without changing the healthiness and safety of the product at all. This is a very important result from a nutritional viewpoint that is evidence of the technological effort sustained by the producers to meet the requirements of the medical world and consumers.

Finally we must not neglect the unsaturated fats, the good ones that are good for health, which together with the long curing process make **Parma Ham** an easily digestible, high protein food; a true energy recharge with positive effects on the cardiovascular system, a panacea for sports activities.



In the following pages, **Prof. Marco De Angelis**, lecturer of Motor Sciences and Science of Sport at the University of Aquila, with a careful and linear view, outlines the concept of well-being linked to diet and identifies nutritional qualities in **Parma Ham** that are suitable for any stage of human life, in particular for sports activities.

The detailed tables are by **INRAN** and consider some aspects of **Parma Ham** such as the lipid and protein component, vitamins and minerals. The analyses refer to a medium cured product (18 months).

*Il Consorzio del Prosciutto di Parma*  
*The Parma Ham Consortium*





# WELL-BEING and DIET

*by Prof. Marco De Angelis*

Thanks to progress in knowledge, in particular in the field of medicine, **these days, people expect not to become ill, to always get better quickly, live longer and above all live better, in complete well-being.** This does not consist only in the absence of disease; it also consists in a sort of psychological and physical state of grace, associated with a sensation of energy and full efficiency of one's body.

Unfortunately, well-being is not a free gift and is not a birthright; it is the result of two components, one passive and the other active.

Whereas the treatment of pathologies is left to experts of medicine, most of the prevention of pathologies and the quality of life are left to us and we actively decide with our behaviour and with our choices to attain true well-being.



## **THEEE PILLARS OF WELL-BEING:**

### **diet and movement**

Despite appearances, modern life is quickly leading us to a condition in which true well-being will be increasingly difficult to achieve. Even though it offers us many more passive solutions, it makes our active role in attaining well-being difficult at the same time, because of an increasingly sedentary lifestyle, unnatural meal times and compositions, an offer of foods that are increasingly processed but poor in essential ingredients and rich in harmful substances.

**The two pillars of well-being, the two active components of our behaviour that allow us to obtain and maintain it, are correct diet and physical activity.**

Both are essential elements of a naturally conducted life and, over thousands of years, these have shaped our body and the bodies of all living beings before us. Diet and physical activity are not however independent of each other, but are closely interconnected. The diet must supply all the elements that will allow a physical activity to be carried out without limitations and all the components needed to meet the stresses that the activity has created, by building new structures and repairing damaged or worn ones.

But if these two elements are not closely connected and interdependent, their quantitative and/or qualitative unbalance always produces negative situations. By way of example, it can lead to excess fat mass, loss of bone mass, reduction in muscle mass, unwarranted fatigue, failed response to the stimuli of the activity, reduced immunity, illness or even just feeling unwell.



## Correct diet

Our diet must supply the body with all the elements it needs to live, the nutritional ingredients, both macronutrients (carbohydrates, proteins, lipids) and micronutrients (vitamins and mineral salts). Like other animals, we are able to survive even if the diet does not offer an optimal amount of all the elements we need. But survival is a concept that is a long way from the well-being that today we can afford and that we rightly expect. The achievement and maintenance of well-being require a continuous and regular input of all the nutrients.

**It is therefore necessary to eat several times a day, but in small quantities, and with all the nutrients, excluding none, balanced with each other according to one's lifestyle.** Because our diet, besides supplying the elements for living, must also enable the body to respond to the stimuli that life, especially if active, has generated.





## Physical activity

Physical activity, movement, exercise, amateur and competitive sport, are just different aspects of the need for our body, and not only for its strictly physical aspects, to perpetuate the activities it has carried out for thousands of years and that it must therefore obligatorily continue to carry out so that the body stays healthy and efficient. Our muscles, bones and joints and tendons are ready to accept the stimuli that physical exercise can give them to form and reinforce them.

Our body is clearly more ready to accept and react to these stimuli during the growth years, when it is valuable to multiply them to excess to build a healthy body, and this happens thanks also to the natural aptitude for playing games and competing in sports.

But daily activity is essential at all ages, since the absence of regular stimuli causes an almost immediate deterioration of the organic structures with progressive loss of physical qualities.

**A few minutes a day of physical activity are therefore the least we should do to grow healthy and keep ourselves strong at first and then autonomous later.**



## MACRONUTRIENTS

MACRONUTRIENT COMPOSITION EXPRESSED IN GRAMS (g) AND ENERGY VALUE ON 100 g OF PARMA HAM.

	Parma Ham*	Parma Ham with fat removed**
Water	50,3 g	58,1 g
Proteins	25,9 g	29,1 g
Lipids	18,3 g	6,4 g
Carbohydrates	0,3 g	0,4 g
Energy value	269 Kcal / 1127 Kj	176 Kcal / 734 Kj

\* Parma Ham "as it is" (lean+fat);  
\*\* Parma Ham with outer fat removed

The distinctive characteristic of Parma Ham lies in its high protein content (25.9%), which in the ham with outer fat removed reaches **29.1%**.

The values obtained in the review of macronutrients confirm the satisfactory results provided by the analyses carried out by the *Stazione Sperimentale per l'Industria delle Conserve Alimentari* in 2003 and the values stated in the Food Composition Tables of the *Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione* published in 2000. For example, total lipids stand at 18.3% for Parma Ham "as it is" and at 6.4% for Parma Ham with fat removed, so consolidating the improvement that had already emerged during the previous analyses. The same is true for the energy content.

## Proteins

These are probably the most noble macronutrient in the diet because, after being broken down in the digestive system into the amino acids they are made up of, they are reassembled by the body to **form all the structures of the body, like muscles, tendons, connective tissue, cartilage, etc.**, as well as other essential components such as enzymes and antibodies.

All the protein structures of the body at all ages are continuously subject to wear and degeneration, so a perpetual daily repair process is necessary and this process uses proteins derived from the diet.

Since we do not have a reserve of them, it is expedient to consume them very often so that they can go and perform their function without the regenerative process slowing down, or worse, stopping, and causing losses that would be difficult to recover.

A frequent input of protein in small amounts at a time also avoids overworking the kidneys. The question of limiting the amount of protein to avoid kidney damage has up to now been greatly emphasized considering however only the total daily sum of the proteins consumed. But in reality, the kidneys can be damaged not so much by a high daily protein input as by its concentration in a few meals, or even in just one, as often happens these days, even with modest daily amounts of protein. Whereas, if it is distributed over many daily meals, including snacks, the kidneys would receive a very moderate load that is well distributed over time. Though also present in foods of plant origin, the proteins we find in foods of animal origin have a higher biological value, since they have an amino acid composition that is more like the proteins that will form the various structures of the body, with a very high amount of essential amino acids (cannot be synthesized by the body), naturally present in their correct reciprocal balance.



In the case of **Parma Ham**, a pre-eminently protein food, it should be emphasized that, thanks to the natural proteolysis that takes place during curing, in other words thanks to the breakdown of the proteins into smaller molecules and into individual amino acids, **more than 20% of the total amount of protein consists of free amino acids.**

In addition to giving this food a very high overall digestibility, this phenomenon contributes to reducing the burden on the kidneys and on the body as a whole, despite the initial high protein content, because the higher workload associated with food proteins is basically due to the input of complex protein molecules and not to the direct input of amino acids.



## PROTEINS

The tables show data regarding the free amino acid composition in Parma Ham “as it is” and in Parma Ham with fat removed. For comparison, the amino acid composition in fresh pork leg is also shown. As can be seen, Parma Ham is rich in proteins of excellent quality and the amount of free amino acids compared to the total protein component is considerably higher in the cured ham (20.5%) than in the fresh pork leg (3%).

The richness in free amino acids depends on the curing processes. During curing, the lean part of the ham undergoes a molecule cleavage process thanks to the naturally present enzymes. These enzymes progressively split the long protein molecules into smaller peptides or even into the individual amino acids that constitute them. This process never stops completely, so making Parma Ham increasingly digestible as curing progresses. The essential amino acid content is also high: their presence and immediate bioavailability **make Parma Ham an excellent food for children, sportsmen and sportswomen, elderly people and anyone who has problems digesting proteins.**

In particular, Parma Ham is rich in valine, leucine and isoleucine. Besides being

essential, these amino acids have a *branched* molecular structure and enter the metabolic cycle of some cells, mainly the muscle cells; during physical activity they perform a *detoxifying and anti-fatigue action*, and contribute to the repair of muscle damage due to the wear that the muscle sustains during movement.

FREE AMINO ACIDS (mg/100g) PRESENT  
IN PARMA HAM AND IN FRESH PORK LEG

	Parma Ham	Parma Ham with fat removed	Fresh pork leg
Aspartic acid	264	303	0,7
Glutamic acid	735	844	5,4
Alanine + taurine	540	620	14,5
Arginine	324	371	3,9
Asparagine	29	33	1,0
Glycine	231	265	7,3
Glutamine	21	24	25,4
Ornithine	91	105	1,2
Serine	262	301	2,4
<i>Essential amino acids</i>			
Phenylalanine	248	285	2,0
Isoleucine	207	237	1,8
Histidine	240	276	3,2
Leucine	441	506	2,8
Lysine	727	835	3,1
Methionine	104	119	1,4
Tyrosine	190	219	2,2
Threonine	240	276	3,3
Tryptophan	66	75	-
Valine	338	388	3,4
<b>TOTAL</b>	<b>5298</b>	<b>6082</b>	<b>88,2</b>



## Lipids

Lipids, or fats, do provide energy but, contrary to common belief, they are more important for their role as components of many structures of the body (for example, cell membranes and myelin sheaths that cover the nerves), for the input of essential fatty acids (that is, they cannot be synthesized by the body), and for the absorption of liposoluble vitamins (A, E, D, K).

A sufficient but small amount of lipids must therefore be consumed daily, being careful to choose monounsaturated and polyunsaturated lipids that have many positive effects, including those on the cardiovascular system, and reducing the consumption of saturated lipids and cholesterol, which have a negative role if consumed in excess but are now present **in extremely small amounts in the fat of Parma Ham**. One of the monounsaturated lipids, oleic acid, which is prevalent in olive oil, but also in the fat of Parma Ham, has a positive role on the composition of blood lipids, with improvement of the ratio between "bad" fat (LDL) and "good" fat (HDL). Equally important is the activity on the composition of blood lipids of polyunsaturated fatty acids, including omega-6 and the omega-3s, of which the body can synthesize two very important ones (EPA and DHA), starting with linolenic acid, which is also contained in the fat of Parma Ham.



## THE LIPID COMPONENT

The analyses carried out on Parma Ham confirm the important reduction in the total lipid component, which had already emerged in the previous analyses, and reaffirm its quality, thanks to the presence of a high unsaturated fatty acid content. Although the fat can easily be removed from Parma Ham to comply with special dietary requirements, its traditional consumption involves eating it complete with its lipid portion in order to be able to detect all the sensorial notes and appreciate its sweetness. These qualities are the result of careful selection of the pig breeds used,

and of the diet and farming of the animals. Parma Ham, as provided for by its strict Production Specifications, is obtained only from healthy animals, of carefully selected breeds, coming from controlled farms where they are fed with a carefully balance diet. This ensures that the fraction of unsaturated fats is considerably higher (64.9%) than that of saturated fats (35.1%), with a high presence in the form of oleic acid (45.8%), a monounsaturated fat, the consumption of which is beneficial for our well-being, since it protects us from cardiovascular pathologies. Of the saturated fats, the presence of stearic acid (10.3%) should be emphasized. This is transformed in the liver into oleic acid, so increasing the amount taken of it. The presence of linoleic acid is also important. This is a polyunsaturated fat (omega-6) that is beneficial in inflammatory processes and in the building of tissues. It is an essential fatty acid, that is, a substance the body cannot synthesize and that must therefore be consumed with the diet; in Parma Ham it forms 12.7% of the total amount of lipids.

#### FATTY ACID COMPOSITION

% on total fatty acids	
<i>Saturated</i>	
myristic (C <sub>14:0</sub> )	1,6
palmitic (C <sub>16:0</sub> )	22,6
stearic (C <sub>18:0</sub> )	10,3
<i>Unsaturated</i>	
palmitoleic (C <sub>16:1</sub> )	2,8
oleic (C <sub>18:1</sub> )	45,8
linoleic (C <sub>18:2</sub> )	12,7
linolenic (C <sub>18:3</sub> )	0,7
arachidonic (C <sub>20:4</sub> )	0,8

The result of the previous analyses was also confirmed for the cholesterol content. In Parma Ham with the fat removed, the cholesterol content is 89 mg/100 g, whereas this value is 81 mg/100 g in the case of Parma Ham "as it is". The presence of cholesterol in the diet is necessary to ensure a state of health, because it is involved in numerous processes in the body; for example, it is the precursor of vitamin D, steroid and sex hormones and serves as nourishment for nervous tissue.



# WELL-BEING and DIET

## **Carbohydrates**

Carbohydrates, preferable complex ones with a more gradual absorption such as those present in cereals, in legumes, in potatoes, basically provide us with ready to use energy for our activities and must therefore be consumed in proportion to the amount of activity performed, especially in meals eaten before the more energy consuming activities. Despite this preference, they must however be present in all meals but never in excessive amounts. A few dozen grams of carbohydrates consumed several times throughout the day, choosing from the various types on sale today (wholemeal to a greater or lesser extent, of various types of flour, rich in gluten to a greater or lesser extent), can be more than sufficient if accompanied by a portion of proteins and lipids.

## **Vitamins**

Although necessary in small amounts, these nutrients are essential for the good operation of all the metabolic reactions that take place in the body. It is essential to consume an adequate amount of all of them and they are certainly not present in all packed and processed foods.

In particular, the group B vitamins (B1, B2, B6, B12 and PP) are essential, among other things, for the optimal operation of nerve structures and red blood cells, for the metabolism processes that supply energy to the active cells and for those that synthesize proteins. It is therefore not by chance that they are present to a large extent, although not exclusively as in the case of B12, in foods of animal origin and, in particular, in Parma Ham, also by virtue of the increased concentration due to the dehydration process associated with curing.

**Their high presence in Parma Ham (in particular, for vitamins B1, B6, B12 and PP) enables very high proportions of the recommended daily amount to be achieved.**





## VITAMINS

Parma Ham is characterized by a high content of group B vitamins. From the current analyses, there emerges in particular a significant presence of vitamins B1, B6, B12 and PP, which perform an important role in the nervous system, in the production of blood cells and in controlling oxidative processes. In particular, Parma Ham contributes considerably to achievement of the recommended daily amount (RDA) for vitamins B1 and B6. The presence of folates involved in many biological functions, in particular in cell replication, was also found. Of the liposoluble vitamins, the presence of vitamin E was observed; this is an essential natural antioxidant that protects from the damage potentially caused by free radicals present in the body.

VITAMIN CONTENT IN 100 g OF PARMA HAM  
AND PERCENTAGE OF RDA PROVIDED

	Parma Ham	RDA%	Parma Ham with fat removed	RDA%
<i>Water-soluble vitamins</i>				
Vitamin B1 (thiamine) mg	0,90	82	1,03	94
Vitamin B2 (riboflavin) mg	0,22	16	0,25	18
Vitamin B6 (pyridoxine) mg	1,13	81	1,30	93
Vitamin B12 (cobalamin) µg	0,67	27	0,77	31
Vitamin PP (niacin) mg	5,90	37	6,77	42
Vitamin B9 (folates) µg	12,80	6	14,70	7
<i>Liposoluble vitamins</i>				
Vitamin E (tocopherol) mg	0,22	2	0,22	2



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## MINERALS

The nutritional value of Parma Ham is also enhanced by the presence of precious minerals such as the trace elements especially, and its consumption can contribute to achieving the recommended daily amount (RDA) of these.

The presence of zinc, copper and selenium (20% of the RDA) should be emphasized: selenium is an antioxidant substance with a protective action on the immune system, cardiovascular system and on cell replication. The iron content is also interesting. Meat and its derivatives are in fact the main source of iron in the diet: in these foods, it is found in the form of heme iron, which is the type with the highest bioavailability and is therefore more easily absorbed by the body.

MINERAL CONTENT ON 100 g OF PARMA HAM  
AND PERCENTAGE OF RDA PROVIDED

	Parma Ham	RDA%	Parma Ham with fat removed	RDA%
Potassium (mg)	538	27	618	31
Sodium (mg)	1730	*	2006	*
Phosphorus (mg)	180	26	207	30
Calcium (mg)	11	1	13	2
Magnesium (mg)	20	5	23	6
Iron (mg)	0,88	6	1,01	7
Zinc (mg)	2,25	23	2,58	26
Copper (mg)	0,03	3	0,03	3
Manganese (mg)	0,01	1	0,01	1
Selenium (µg)	11	20	13	24

\* No RDA value is given for this mineral.

Within the context of assessing the mineral salt composition, an interesting aspect to be considered is the mechanism that for centuries has enabled fresh pork legs to be transformed into Parma Ham. This metamorphosis takes place through the action of the only ingredient allowed by the Production Specifications, in addition to pork: sea salt. During curing, which takes at least 12 months, progressive dehydration of the product takes place, thanks to the gradual absorption of salt and the concomitant loss of water. This process ensures the safety of the product, in addition to the unmistakable characteristics of aroma, colour and flavour. According to the results of the bromatological analysis on Parma Ham, the salt content is today 15% lower than it was in 1993, thanks to the evolution of the production systems and to the control of the drying and curing periods, and is 4.4% in Parma Ham "as it is" and down to 5.1% from 6.0% in the ham with fat removed. This reduced salt content also contributes to giving Parma Ham its extraordinary and unmistakable sweetness.

### **Mineral salts**

These are essential like the vitamins and are generally contained in foods of animal origin in a more bioavailable, that is, more absorbable, form than that contained in foods of plant origin where the mineral salts are often bound to other compounds. The most important and well known example of this greater bioavailability for elements present in foods of animal origin is certainly iron, which is almost completely unusable if contained in vegetables, even though present in large amounts. Of the foods of animal origin, the few that, like Parma Ham, do not need to be cooked, preserve an even higher amount of it.

**Potassium, phosphorus, zinc and selenium are present in very significant amounts in Parma Ham, so contributing important proportions of the recommended daily amount.**

Excessively demonized since time immemorial, salt *par excellence* (sodium chloride), the only aid used for the preparation and preservation of Parma Ham, has recently been widely reappraised by the scientific community on the basis of the most recent studies.

These have in fact shown that, if it is true that consuming too much every day can be harmful in the long run, it is also true that, since it is essential, it must be normally present in the diet and in amounts that are not exactly



negligible. It is in any case essential, for the reduction of potential negative effects of sodium, for its consumption in the diet to also be counterbalanced by a certain amount of potassium, which Parma Ham is already particularly rich in anyway.



## NATURAL ANTIOXIDANTS

In addition to vitamin E and selenium, the current analyses have highlighted the presence of another two natural antioxidants: carnosine and anserine.

AMOUNT OF CARNOSINE AND ANSERINE EXPRESSED IN mg/100g  
OF PARMA HAM

	Parma Ham	Parma Ham with fat removed
<b>Carnosine</b>	<b>499,3</b>	<b>573,2</b>
<b>Anserine</b>	<b>31,3</b>	<b>35,9</b>

Carnosine is a molecule consisting of two amino acids,  $\beta$ -alanine and histidine, and there is a good amount of it in muscle tissue, for which it controls some metabolic processes for energy production.

Its ability to inhibit oxidative reactions, derived also from the action of iron, and to protect muscle cells from free radicals has also been shown. Anserine is also a substance naturally present in muscles that takes part in the antioxidant action performed by carnosine.



## ABSENCE OF POTENTIALLY TOXIC SUBSTANCES

Another element of great importance is the **absence in Parma Ham of colouring agents or preservatives**, such as for example nitrites and nitrates, commonly used in the preparation of other meat based products. The only ingredients allowed by the Production Specifications are in fact pork and salt.

The analytical check has also highlighted the total **absence of potentially toxic substances** in Parma Ham.

In particular, the presence of heavy metals such as lead, mercury, chromium, cadmium, tin and nickel was not found. This indicates absolute compliance with food safety protocols and gives guarantees of genuineness, by confirming the absence of any contamination or environmental pollution at each individual stage of the production chain.



## WELL-BEING:

### stages of life and special activities

#### Growth

All stages of body growth, until full maturity, involve the enormous work of building body structures, but also of hormones and other substances, with a strongly positive daily balance between added elements and worn elements. It is therefore clear that it is basically the protein input, in addition to that of the vitamins involved, that must be strengthened at this stage, while trying to maintain throughout the day the right flow of foods with high protein content and, to combat the growing problem of child obesity, with low calorie content. Protein foods must preferably be from animals for the input of essential amino acids.

**Of the high protein foods, Parma Ham**, for all the above-mentioned properties, including the high percentage of free amino acids and the good vitamin content, **can certainly be considered one of the best, also for its convenience as an ingredient in healthy rolls, in place of poor quality high-calorie snacks containing very little protein or other noble elements.**

#### Pregnancy and breastfeeding

During pregnancy and breastfeeding the need to *build* is paramount too. Therefore in these conditions, the input of protein is of vital importance and must absolutely never be restricted, perhaps by consuming **foods like Parma Ham that due to their high nutritional density, good digestibility, together with an always welcome low calorie input for the mother**, can be an ideal solution for the frequent, small meals that a woman prefers during this period.

## Old age

**One of the main and increasingly evident problems in old age is sarcopenia, that is, the progressive and serious loss of muscle mass and, consequently, of muscle function,** with all the problems that this involves such as extreme weakness, reduced autonomy, and increased risk of falling.

This phenomenon is the result of the concurrence of three factors: lack of physical exercise with consequent absence of stimulation for the maintenance of the existing muscle mass; the natural tendency of the body at this stage of life towards a negative balance, which causes a reduced aptitude for replacing worn and damaged elements; low consumption by the elderly of foods rich in proteins, generally due to their poor digestibility and to difficulties connected with their preparation and/or their short preservation time that forces the elderly person to go shopping too often. In addition to combating the first two factors with a physically active life, it is therefore essential to also ensure that, every day, the elderly person's diet contains foods rich in proteins, which do not require preparation, have good storability and are easy to digest.

**Parma Ham is an ideal food for the elderly person by virtue of its protein content, because of its convenience and storability, and because of its high digestibility thanks to the important amount of protein that is in the form of free amino acids and therefore directly absorbable.**

## Heavy work

**Many work activities involve major physical effort or less intense physical effort that is however repeated for a very long time.** In addition to the total energy component of the diet that must be increased proportionally to the energy consumed, a high protein input must also be considered for repairing the structural wear of muscles, cartilage, joints and tendons caused by intense or repeated movements.



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But work activities of this type often involve hours or logistics that are unlikely to be compatible with meals complete with a protein rich *main course*, and therefore often only the energy input of carbohydrates is consumed, with just a *first course*, leaving the *protein* meal until the evening. However, doing this overloads the body with amounts of proteins that are too concentrated into just one meal and, at the same time, there is a risk of not consuming the proteins necessary for the repairs made necessary by daily wear. But the presence, starting with breakfast and in various subsequent snacks, of small amounts of proteins, such as those contained in **suitable portions of Parma Ham, ensures the correct distribution of the protein element.**

## Sport

As we have already mentioned, **regular physical activity is absolutely essential at all ages, but requires a correct diet for the benefits to be complete.**

Sport, that is, having frequent training sessions, is able to provide enormous stimuli for various structural and functional components (muscles, tendons, ligaments, bone, cartilage, heart, blood vessels, cell metabolism processes, enzymes, mitochondria, etc.), and it consequently needs a diet that must aim at maximum balance, in order to obtain the required improvements and also to avoid the all too frequent side effects of a sports activity.

## Building and repair

In fact sport, with continuous repetition of specific, very intense or continuous movements that always stress the same structures, brings about positive stimuli for creating new structures that did not exist before or for reinforcing existing ones, but at the same time also causes, perhaps chronically perpetuated, micro- and macroscopic acute damage that produces an exceptional wear process.

All these phenomena basically involve the body's protein components, and therefore, if the food protein input is commensurate with the stimulus, the body will be able to build what the training has asked it to create (muscle fibres, stronger tendons, blood vessels, mitochondria, enzymes, etc.), otherwise it will



all have been in vain, if not harmful. It is therefore the protein component of the sportsman's/sportswoman's diet that will make the difference between continuous improvement and failure or worse, acute trauma or chronic damage.

And this is true not only for the strength and power disciplines, where the role of well represented muscles is clearly prominent, but also, and perhaps especially, for the endurance disciplines, in particular for running in which muscle wear with microscopic, but numerous, injuries is continuous and great. In the sportsman's/sportswoman's diet, proteins from animal sources are clearly to be preferred for their high biological value and for the presence of essential amino acids in optimal proportions.

## **Digestibility**

The need to consume all the proteins that one requires when playing a sport however often does not fit in with the typical hours of sportsmen and sportswomen, whether they are amateurs who play sports in the little time they have available or professionals who have little time between one training session and the next to digest meals that are very rich in proteins. The solution is clearly to consume foods with a particular composition divided up as much as possible in main meals and snacks: rich in proteins, but highly digestible, low in fat, in particular in cholesterol, but having good fats, which are carriers of vitamins and other elements.

**Parma Ham, accompanied by an amount of carbohydrates proportional to the duration of the active stages of training, is one of the best traditional foods for this purpose.**

In fact, it allows an important amount of proteins in highly digestible form, because it is rich in free amino acids, to be provided; of these, the considerable presence of branched amino acids should also be emphasized as they are particular ones because they are assimilated quickly and involved in plastic functions and in the direct production of energy and in the optimal management of lactic acid and the sensation of fatigue. The very low lipid content, in particular as regards cholesterol, although providing an important amount of mono and polyunsaturated lipids, which are very beneficial for better



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blood fluidity and essential in sport, make Parma Ham very digestible and highly suitable for all sportsmen and sportswomen, even the most intransigent ones about calorie restriction and weight control.

## Other elements

In addition to having a good protein content and allowing easy digestibility, the sportsman's/sportswoman's diet must however also contain, in the most balanced form possible, all the additional special elements to support the particular quantitative and qualitative requirements of the athletic body. The group B vitamins, involved, among other things, in the production of energy and the formation of red blood cells, are probably the most important ones for a sportsman/sportswoman. **The rich, natural and balanced amount of group B vitamins in Parma Ham therefore make it ideal not only for sportsmen and sportswomen who are looking for a large protein input because their discipline is muscular but also for those who participate in endurance disciplines**, where an excellent production of energy and the input of oxygen to the muscles through the red blood cells are the main limiting factors.

In addition to vitamins, there are however other elements that, following research that has shown their usefulness, sportsmen and sportswomen often try to take in the form of supplements. Two of the most used of these special elements, besides the branched amino acids already mentioned, are: creatine, which is important for contraction and for local muscle metabolism and is naturally present in the muscle tissues of animals, even though changed by cooking; and carnitine, which facilitates the transport of fats inside the mitochondria for their use as energy and is also very present in meat foods, especially red meat. In this sense, **Parma Ham is an excellent source for their input in food** and therefore should be preferred among the various natural foods before thinking of resorting to extra forms of consumption.

Finally an element that is apparently banal but is essential for those participating in sports in unfavourable, hot-humid, climatic conditions of particular areas and periods, and also in closed spaces (sports halls, gyms), is the correct input of salts, including sodium and potassium, which enables consumed liquids to be retained for optimal hydration and to combat the loss of salts through sweating, also bringing about the prevention of bothersome cramps.

## Slimming diets

During slimming diets, it is essential to ensure that, although reducing the total calories consumed, the lean mass is not reduced, and this can be obtained only if the protein input is kept absolutely normal.

However, proteins provide fewer calories than fats and carbohydrates and cause a moderate metabolic activation, and therefore they are the element that someone who is watching their weight can more safely eat a lot of. If it is in any case important to consume foods that overall are relatively low in calories, **Parma Ham**, which is one of the foods that are richest in proteins and less rich in calories, can be an important element in a slimming diet.



# NEW PRODUCTION AND TECHNIQUES

*by the Stazione Sperimentale per l'Industria delle Conserve Alimentari (Experimental Station for the Food Preserving Industry)(SSICA)*

Updating of the nutritional values gives the opportunity for some technical observations on the meaning that the new chemical and nutritional parameters of Parma Ham have also in production and technological terms.

In comparison with the previous values, the figure that strikes even the lay reader is the one regarding the salt content that has decreased by about a point in absolute value, which means over 15% less salt (and therefore sodium) than before.

From a nutritional perspective, this is a very important reduction given the unanimous advice to reduce salt consumption, but it is even more so if the fact is examined from a technical-production viewpoint, that is, from the viewpoint of the impact that this change has meant for the producing companies. Salt is in fact much more than a simple ingredient for the Ham, as it has a decisive role in all the mechanisms that govern a good result: it acts as preservative, since additives are not allowed, gives texture to the muscle mass, regulates the action of the muscle enzymes responsible for flavour and aroma, activates the colour formation processes, and favours cohesion between the meat components (muscle, connective tissue, rind, fat), so ensuring that the slice remains intact when cut. Reducing salt in the Ham without support work could undermine at its foundations the complex architecture of the sensorial and sanitary requirements.

If in the ten-year course of reducing the salt content, Parma Ham has maintained or even improved its essential characteristics, it is because in the management of the process, the Consortium's companies have paid increasing attention to the problems of salt diffusion, to the prevention of microbial defects, to the strict invariability of the processing stages. It can be estimated that over 10-20 years, just the duration of the so-called "cold stage", consisting of the salting and resting stages that precede curing proper ("warm stage") has on average increased by three weeks, from the 70-90 days of the nineties to the current 90-110 days (the range of values reflects the various requirements arising from the introduced weight categories). This extension has ensured that the salt concentration in the

heart of the product stays basically unchanged at the critical moment of passing from the cold stage to the warm stage. In other words, the longer time at low temperature has allowed the effects of the reduction in total salt to be "compensated", so obviating the inevitable slowing of diffusion into the innermost layers.

The effects of this change have not been negligible and have brought about a general lengthening of the entire production process. Also due to the increase in the weight of the fresh pork leg, the curing time of cured Parma Ham has increased progressively, and curing continues for a few months beyond marking. From this emerges the profile of an altogether "sweeter" product, but one that is also more costly to produce, due to the direct consequences of the longer curing time (drop in weight, financial charges, logistics and, on the energy consumption level, the higher running costs associated with a lengthening of the cold stage).

In the described scenario, the important element is that such a considerable reduction in salt content has not had negative consequences on the health safety of the product, characterized by unchanged health standards. This is confirmed by microbiological tests, carried out by simulating even abnormal contamination conditions, that show that the normal production process, if duly carried out, is alone able to guarantee the wholesomeness requirements of the cured product.

Having recognized the importance of the achieved targets, it can be considered that the road to further improving Parma Ham from a nutritional viewpoint has new phases before it, in terms of salt reduction and for improving the quality standards. It is however obvious that the margins for improvement are becoming narrower and that a future possible salt reduction will go hand in hand only with the evolution of research that is engaged, also with the support of the Consortium, in identifying new positively sustainable objectives.

But the interesting new facts about the nutritional values do not stop with the salt content. The analyses carried out point out previously little known facts about the contribution of vitamins and mineral salts of the product, which is a significant source (the expression is applied also in relation to EC Regulation no. 1924/06) of the group B vitamins, zinc, as well as proteins and phosphorus. What appears to be of particular interest is the intactness of these nutrients even after over 12 months from the start of



processing. This is a sign of an intrinsic stability of the components themselves, but also of the low impact of the curing and of the processing method used, which would for this reason deserve to be counted among the so-called "mild" food processing techniques.





**Parma Ham**

*Well-being and diet  
Nutritional values*

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