eat lipids and human nutrition and health

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bstract:

eat is often considered as rich in saturated fat, and then most physicians recommend to ower its consumption.Several epidemiological studies contain an evidence of relationship etween saturated fat intake and cardio-vascular diseases and at least some type of ncers.But fat content of muscles is generally low. The latest studies about quantity and ature of fat in meat show that in meat as eaten, the proportion of fat is well below the ntent of carcass or raw meat, and that the fatty acids are not all saturated.

reover the comparisons of meat intake in different countries, and specially between U.K. d France, and the differences observed in cardio-vascular disease frequency do not pport the hypotesis of a direct relationship between meat intake and cardio-vascular isease frequency.The responsability of meat in this morbidity is far from evident.

the other hand, the presence of arachidonic acid in meats is a reason for meat nsumption, as this fatty acid is difficult to obtain from other food sources.

though meat is one of the favourite food for most people, it is often said that its nsumption is excessive, and can be a threat for health.This fear is based on 2 types of ta: studies on consumption, generally base on disappearance studies (food balance heets),and epidemiological studies, mainly the US ones, concerning cardio-vascular iseases or cancer. A third confounding factor, for France,is the difference in fat content f animals in the United States and in France.

our knowledge progresses,about portions really consumed, nature of fatty acids of eat fat, and epidemiological studies in different countries, it becomes far less evident hat meat is implied in these diseases, because of its high content in saturated fatty cids.

he first point is: is there really a relationship between meat consumption and cardio-vascular diseases ? Many studies give different results. My first slide concerns a comparison of food consumption in the U.K. and in France, knowing that the cardio-vascular ncidence in U.K. is three times that of France. The correlation with meat consumption is,

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at least, not evident..

As a second point,if we admit that cardio-vascular diseases are related to fat consump
level, let us look at the fat content of some pieces of meat usually consumed in France
The content of fat is sometimes very low. Furtherall, we have to compare it with the
content of other foods, the consumption of which are growing in affluent societies.
As a third point, the latest analysis about meat fat show that about half of the fatty
acids are mono-unsaturated, and we think, now, that these fatty acids are not atherogen
Some searchers believe that they are protective,as they are part of the so called
"Mediterranean diet".Moreover, some long unsaturated fatty acids may be of importance f
older people, unable to elongate unsaturated fatty acids: meat is the main food source
arachidonic acid for man.

Another point to be taken into account, speaking of lipids in meat is that the relation
the proportion of the fatty acids of the 2 series of essential fatty acids, N-6 to - N-
is in the muscle, around 3, which is a very satisfying ratio. It is now admitted that
these 2 series being elongated by the same enzymes, it is necessary that they remain in
acceptable ratio.

In conclusion,we may say that lipids in meat are not such a big problem as long as peo
eat really the meat and not the fat around the meat. The intramuscular content of fat is
rather low, half of these fatty acids are monounsaturated, the amount of polyunsaturated
fatty acids, although low, is well equilibrated between the 2 series, and some long cha
are present.Meat is not, by far, the main source of saturated fatty acids in the diet,
it has, by its content of minerals and vitamins, a very important rôle in human nutriti
It is necessary to inform the consumers of these facts, because the changes in consumpti
from meat to other products is not an answer to problems of either malnutrition or
overnutrition.

References

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Food consumption* in U.K. and in France (Kg/p./y) in 1965 and 1975

	1965		1975	
	U.K.	F	U.K.	F
Vegetable fat	8,1	10	9,1	10,5
Animal fat	16,4	12,4	16,2	16,6
Meat: beef	22,8	27,3	23,7	28,7
mutton	10,9	2,5	7,8	3,4
pork	27,4	28,1	24,3	33,1
poultry	7,4	17,4	11,8	22,3
offal	4,8	7,8	4,5	9

Incidence of cardio vascular diseases (men 35 - 64 years) in 1980:

U.K. > 300/100 F. < 100/100

* Data from F.A.O. Food balance sheets.

Nutritional value of cooked beef meat pieces

analysis: Centre de Recherches FOCH

Per 100 g.	Prot. g.	Lip.	L./P.	kcal .	Mg.	Zn. mg.	Fe.
Faux filets (40 samples) mean	26	7	O,28	176	24	5	4
Steaks (20 s.) mean	24	7	O,3	162	23	7	4
Bavette (10 s.) mean	24	6	0,25	152	25	7	5
Rosbeefs (10 s.) mean	26	4	O,15	151	26	5	5
Braised beef (10 s.) mean	32	8	0,25	214	24	10	6

Protein and fat content of some foods

Food	Protein (g) (/100g)	Lipids (g)	Lipids/proteins
Steak	20	5	0,25
Entrecote	24	12	0,5
Beef stewed with carrots	7	5	0,7
Hot dog	11	15	1,4
pizza	5,1	10,5	2
croissant	9	20	2,2
ice cream	4,3	9,5	2,2
sausages (Francfort)	12,5	28,8	2,3
chocolate bars	6	23	3,8
chocolate brownies	6,2	25,8	4,2

fatty acid content of triglycerides and phospholipids of muscles

	Chicken	pork	beef
Triglycerides (mg/g)			
Saturated	329	383	473
mono-ins.	374	453	410
poly-ins.	198	65	18
18:2 N-6	172	50	14
18:3 N-3	11	6	4
phospholipides (mg/g)			
Saturated	279	243	227
Mono-ins.	162	147	210
poly-ins.	269	309	233
N-6	234	282	178
18:2	101	209	97
20:4	101	62	59
N-3	26	21	56
18:3	1	7	13
20:5+22:5+22:6	25	14	43

from GANDEMER, 1992

Main fatty acids in fat of beef, mutton and pork
% of total fatty acids

	sub cutaneous fat			intramuscular fat		
	P	B	M	P	B	M
C 14 : 0	1,1	3,3	3,9	0,6	3	4,8
C 16 : 0	24,4	26	25,1	23	31,6	24,7
C 16 : 1	6,1	9,4	2,4	4,9	4,3	3,2
C 18 : 0	6,6	8,2	15,1	5,2	18,9	15,3
C 18 : 1	46,6	44,7	43	52,4	36,6	43,3
C 18 : 2	13,7	2,1	4,7	12,5	1,2	4,4
C 18 : 3		1,1	1		0,9	1
Total Sat.	32,1	37,5	46,6	28,8	53,5	46,6

from B.L. DUMONT,1989