DAIRY AS A WHOLE FOOD

WHAT IS THE IMPORTANCE OF DAIRY IN HEALTH ACROSS ALL AGES

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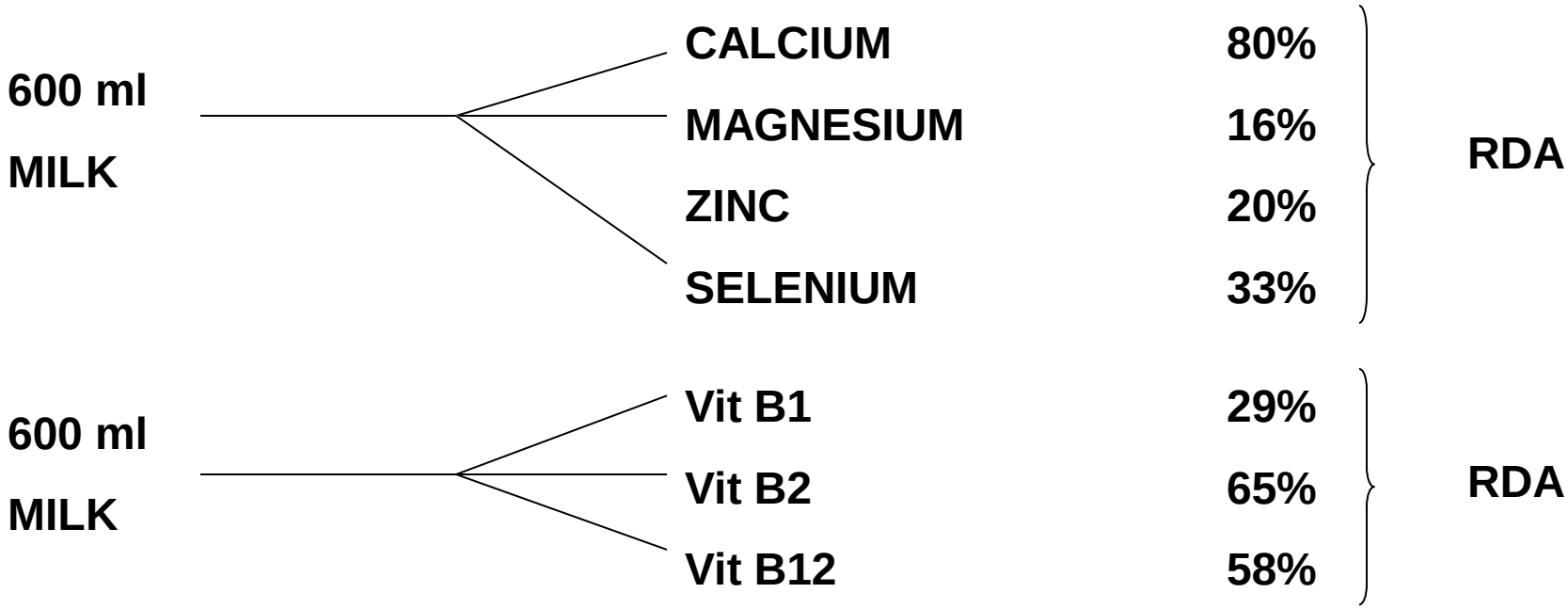
Fondation reconnue d'utilité publique

MILK AND DAIRY PRODUCTS
A UNIQUE MICRONUTRIENT COMBINATION

IMPORTANT SOURCES OF



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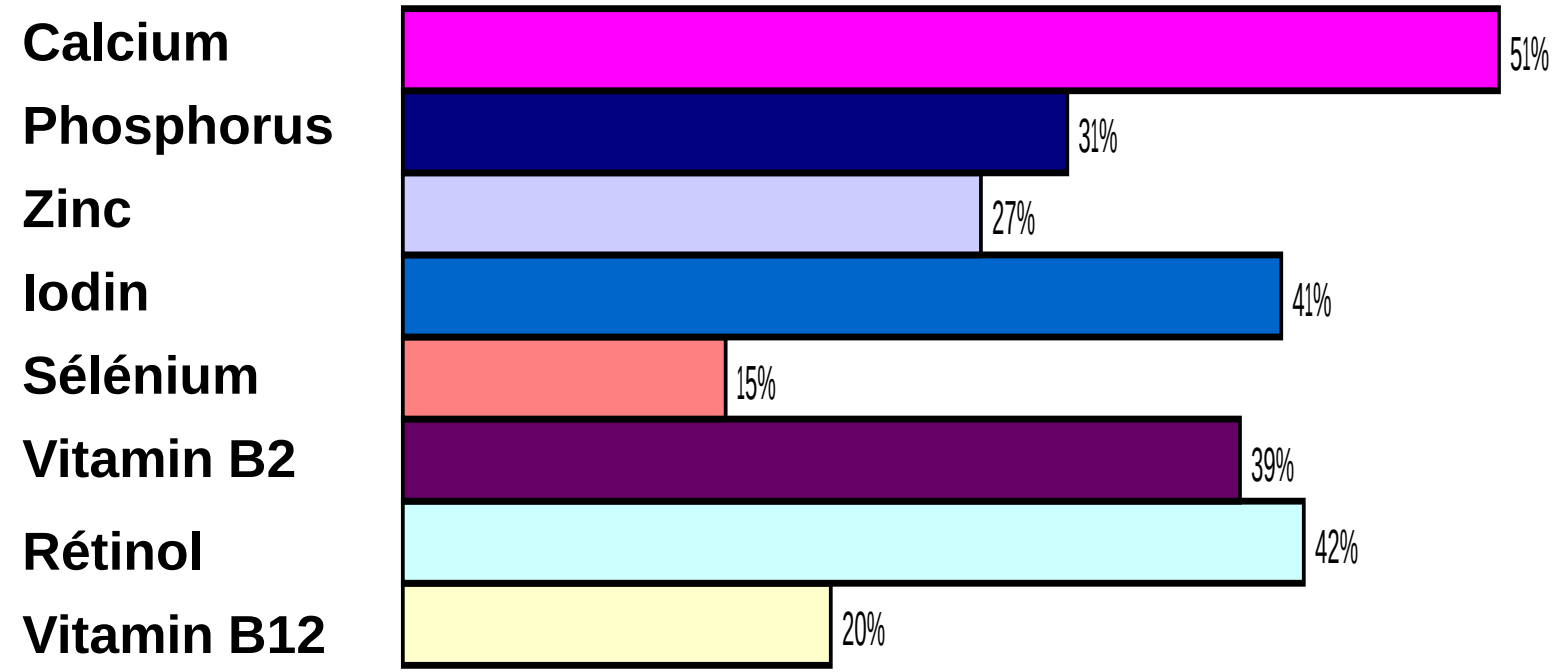
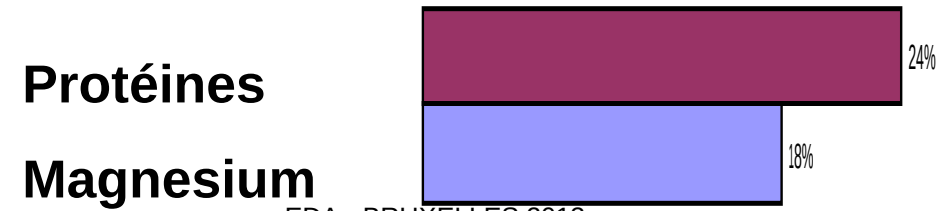
DAIRY PRODUCTS AND MICRONUTRIENTS INTAKES

CHILDREN

FIRST CONTRIBUTION



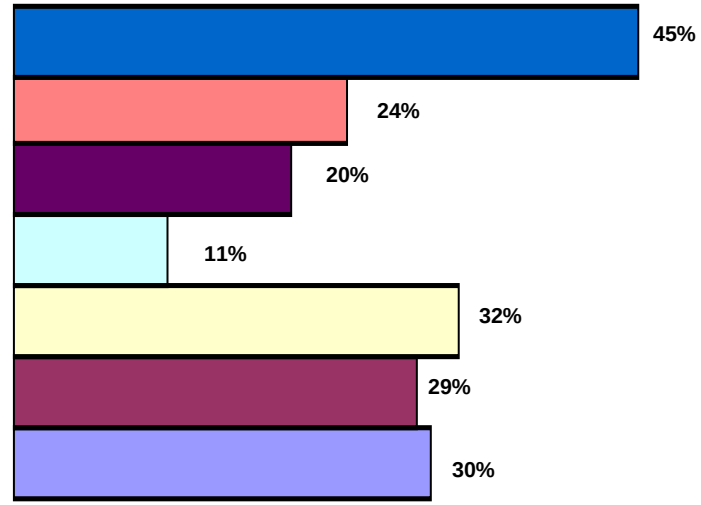
SECOND CONTRIBUTION



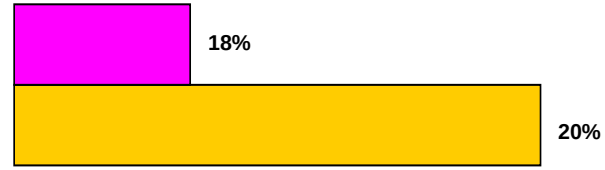
DAIRY PRODUCTS AND MICRONUTRIENTS INTAKES

ADULTS

FIRST CONTRIBUTION



SECOND CONTRIBUTION



THIRD CONTRIBUTION

THE CONTRIBUTION OF DAIRY PRODUCTS TO MICRONUTRIENT INTAKE

DAIRY PRODUCTS

CONTRIBUTION TO THE GLOBAL INTAKE

In France INCA 2 STUDY

	CHILDREN	ADULTS
CALCIUM	53 %	46 %
PHOSPHORUS	31 %	
IODINE	40 %	30 %
POTASSIUM	21 %	
VITAMINE B2	38 %	28 %

In the Netherlands : THREE NATIONAL FOOD CONSUMPTION SURVEY + LEIDEN LONGEVITY STUDY (LLS)

LLS

		CHEESE	MILK
CALCIUM	63 %	27 %	Total dairy
FOLATE	11 %		6 %
VITAMIN B12	31 %		15 %
VITAMIN D	9 %	5 %	
VITAMIN C	7 %		4 %

CONTRIBUTION OF MILK AND MILK PRODUCTS TO MICRONUTRIENT DIET OF THE US DIET

MILK AND DAIRY GROUP

	ADULTS	CHILDREN
CALCIUM	38 %	47 %
VITAMIN A	33 %	42 %
VITAMIN D	44 %	
VITAMIN B2	29 %	29 %
ZINC	26 %	16 %
PHOSPHORUS	21 %	29 %
VITAMIN B12	20 %	29 %
SELENIUM	18 %	12 %
POTASSIUM		22 %

LOWEST COST SOURCES

MILK AND DAIRY PRODUCTS

- PROTEINS
- CALCIUM
- VITAMIN B2
- VITAMIN B12

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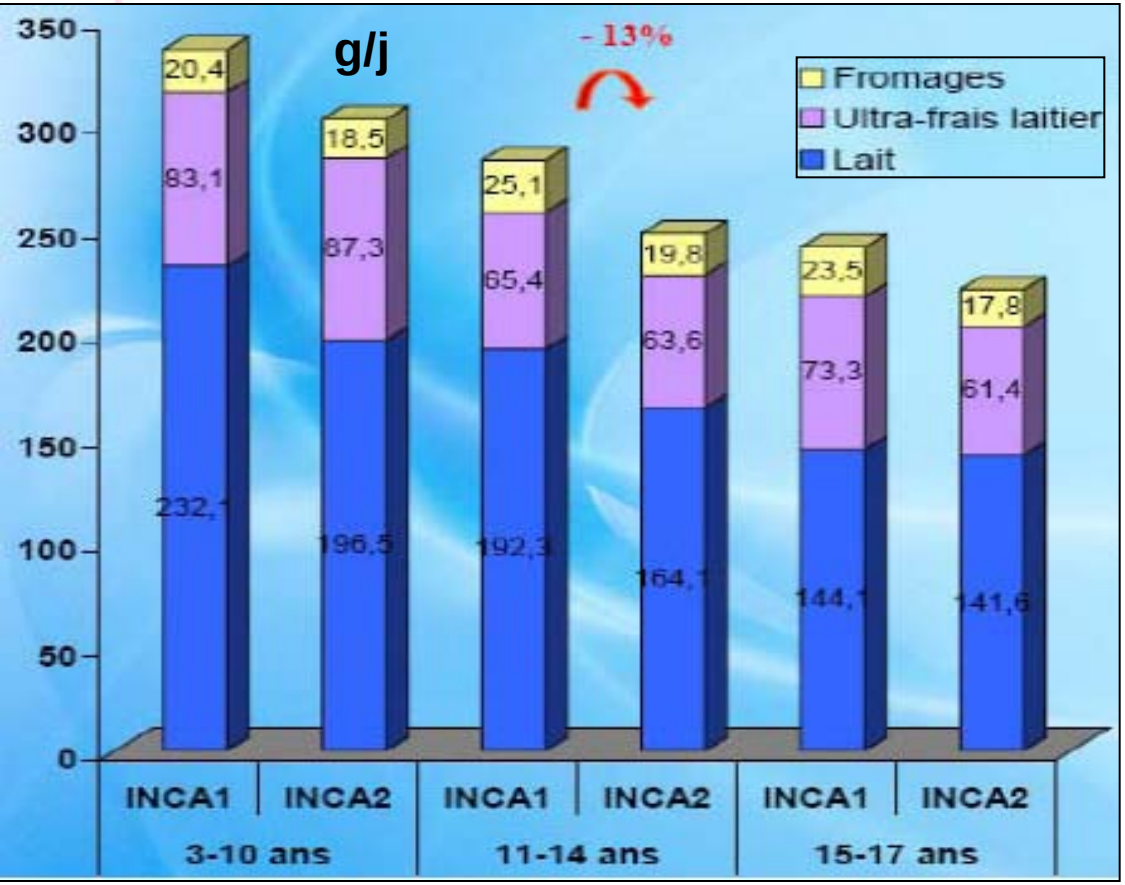
THE RECENT EVOLUTION OF DIETARY HABITS IN CHILDREN

DIETARY SURVEY INCA$_2$ IN FRANCE FROM 1998 – 99 TO 2006 – 2007

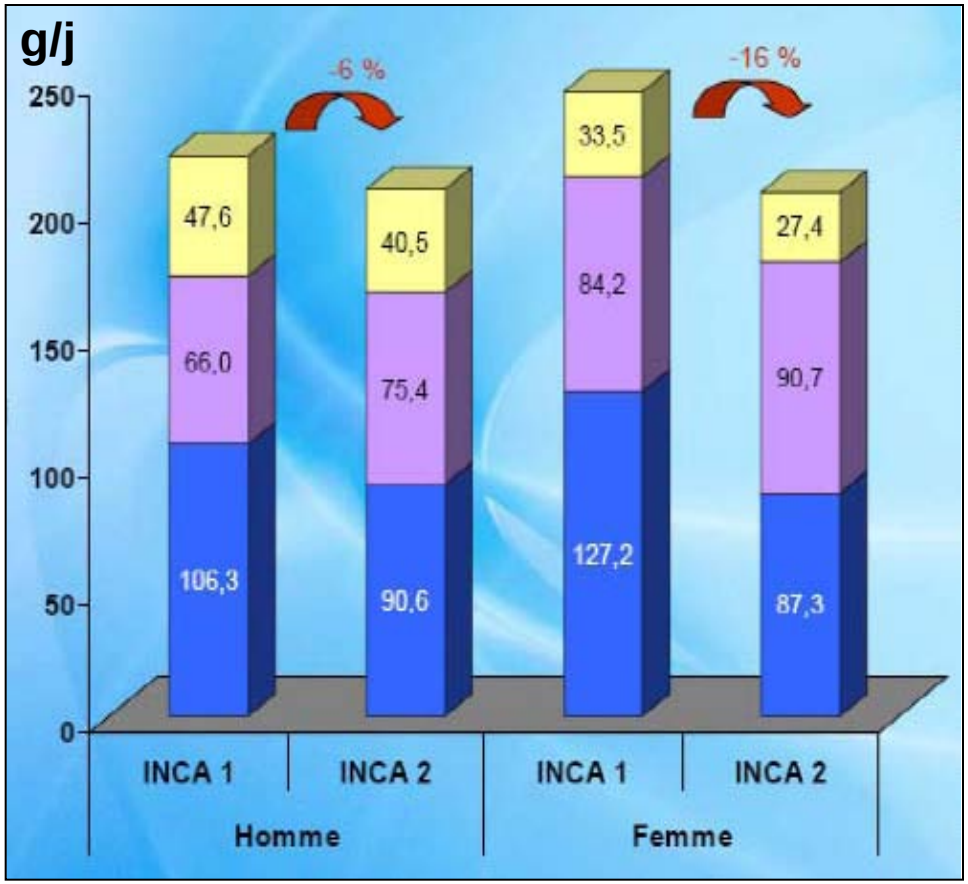
	3 – 14 years	15 – 17 years
MILK	-14,9%	-1,6% NS
CHEESE	-13,9%	-24,3%
ALL DAIRY PRODUCTS	-10,5%	-8,3% NS

DECREASE OF THE FRENCH DAIRY CONSUMPTION

Enfants



Adultes



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Source Inca, Afssa

IT IS NECESSARY TO MAINTAIN MILK SCHOOL FEEDING PROGRAMMES

IN ORDER TO MAINTAIN

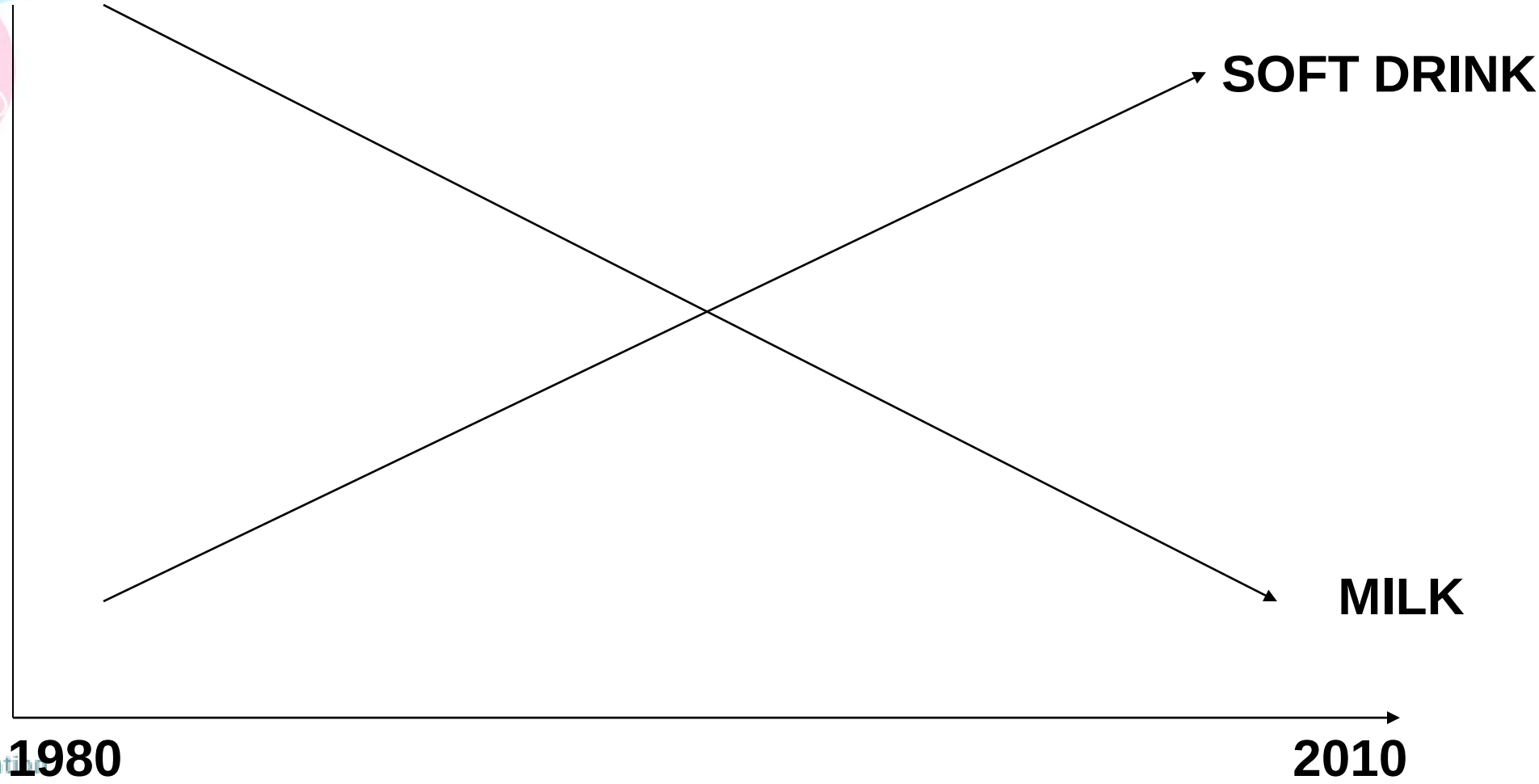
- **TASTE FOR DAIRY PRODUCTS**
- **LACTASE ACTIVITY AND LACTOSE TOLERANCE**
- **GOOD DIETARY HABITS WITH DIVERSITY**
- **NUTRITIONAL INTAKE FOR REACHING RECOMMANDED DIETARY ALLOWANCES**

PARTICULARLY IN UNDERPRIVILEGED FAMILIES

WHY MAINLY IN LOW-INCOME FAMILIES ?

HIGHER PREVALENCE OF OBESITY	**LOW COST OF DAIRY NUTRIENTS**	**INSTEAD OF SOFT DRINKS**

THE BURNING ISSUE OF THE CROSSING EVOLUTION OF TWO DRINKS



DIETARY REQUIREMENT OF CALCIUM

REVISED IN 2011

IN ADULT MEN < 60 years

→ REQUIREMENT 750 mg/day

→ RECOMMENDED DIETARY ALLOWANCE 900 mg/day

[= Requirement + 2 standart deviation = 750 + 150]

CANNOT BE EASILY REACHED WITHOUT DAIRY PRODUCTS WHICH MAY ACCOUNT FOR 2/3 OF THE RDA

WHICH RECOMMENDATIONS ?

- NUTRITIONAL RECOMMENDED INTAKE

FOR THE FRENCH POPULATION

ANSES - CALCIUM : 900 mg /day

1000 mg (pregnant and breastfeeding women)

1200 mg children, adolescents, women > 55 years, men > 65 years

- FOOD RECOMMENDED INTAKES

PNNS : 3 dairy products/day

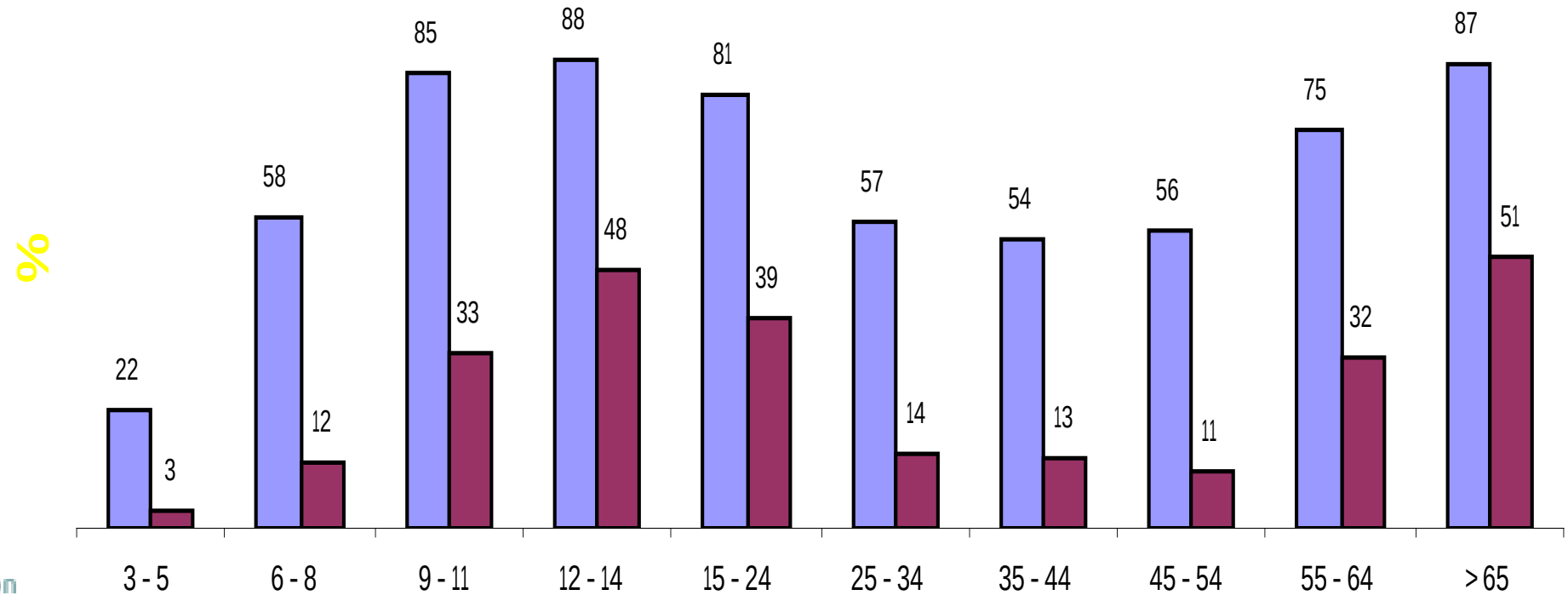
to 4 dairy products/day (children, adolescents, elderly)

RDA ARE NOT ACHIEVED

RDA

CCAF SURVEY

- **CALCIUM INTAKE < RDA**
- **CALCIUM INTAKE < 2/3 RDA***



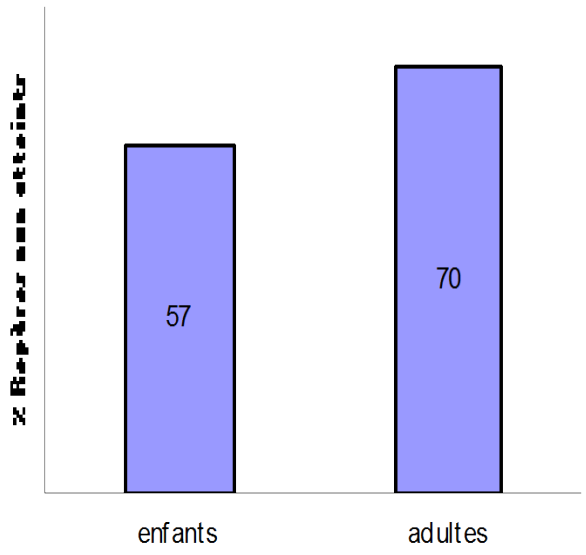
*Risque de carence

NON ACHIEVED RECOMMENDATIONS

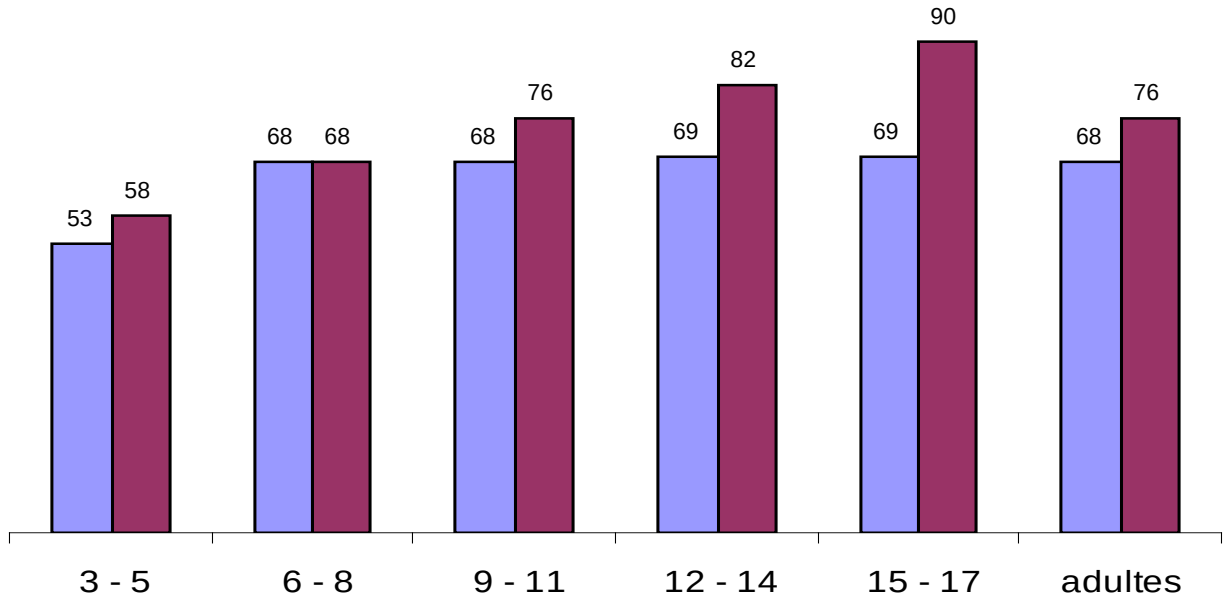
FOOD INTAKE

NUMBER OF DAIRY SERVINGS

ENNS SURVEY



CCAF SURVEY



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EARLY BEHAVIOR AND FURTHER HABITS

MILK CONSUMPTION IS NOT DEVOIDED TO INFANTS AND CHILDREN

BUT IS USEFUL AT ANY AGE

BECAUSE OF ITS NUTRITIONAL COMPOSITION

AND OF ITS CONTRIBUTION TO RECOMMENDED DIETARY ALLOWANCES

SINCE LACK OF MILK AND THEN LACTOSE, CONSUMPTION

INDUCE A LACK OF LACTASE ACTIVITY

AND CREATE A LACTOSE INTOLERANCE

ITS IMPORTANT TO MAINTAIN DAIRY CONCUMPTION ALL OVER THE LIFE

DIETARY QUALITY AND DAIRY PRODUCTS IN EUROPEAN ADOLESCENTS

HELENA – Cross Sectional Study

- 1804 European adolescents

- 10 different European cities

- Dietary 24 h recalls

- Blood samples

} **profile of fatty acids**

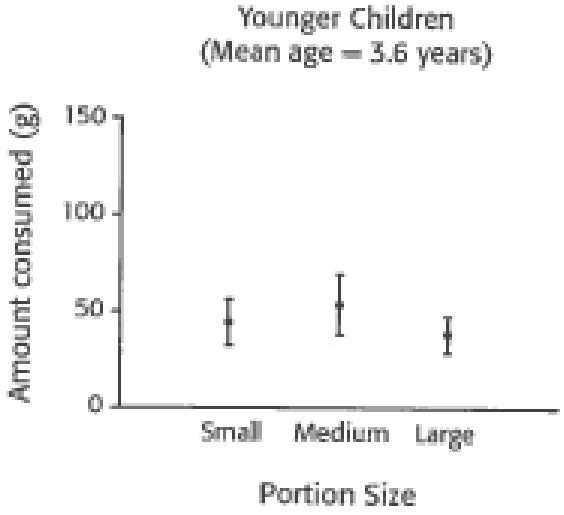
→ IN ADOLESCENTS WITH HIGHER DIET QUALITY INDEX (DQI) SCORES FOR ADOLESCENTS COMPARED TO LOWER DQI – SCORES DAIRY PRODUCTS CONTRIBUTE MORE TO THE INTAKE OF FAT

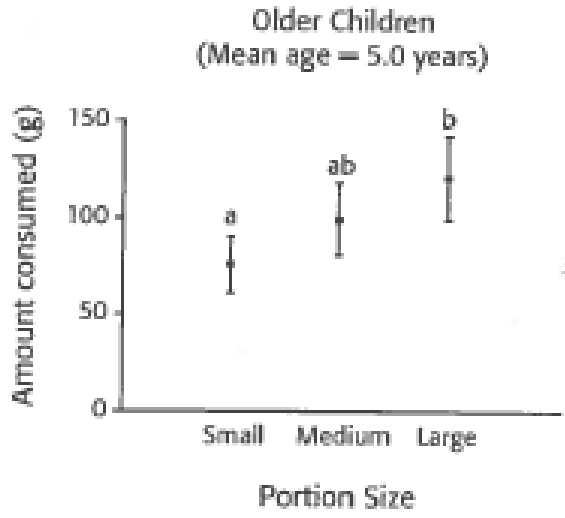
THAT MEANS THAT DAIRY PRODUCTS CONTRIBUTE - HIGHLY TO - THE DIET QUALITY

Nutrition 2013, 29, 411-419

REGULATION OF FOOD INTAKE IN CHILDREN

CHILDREN AGED 3 TO 6 YEARS, SERVED THREE PORTION SIZES OF MACARONI AND CHEESE ARE ABLE TO CONTROL THE QUANTITIES EATEN DESPITE THE INCREASE IN PORTION AROUND THE AGE OF 3,6 YEARS BUT NOT AT THE AGE OF 5,0 YEARS





J Am Diet Assoc 2000, 100, 232-4

DAIRY PRODUCTS

AND HEALTH

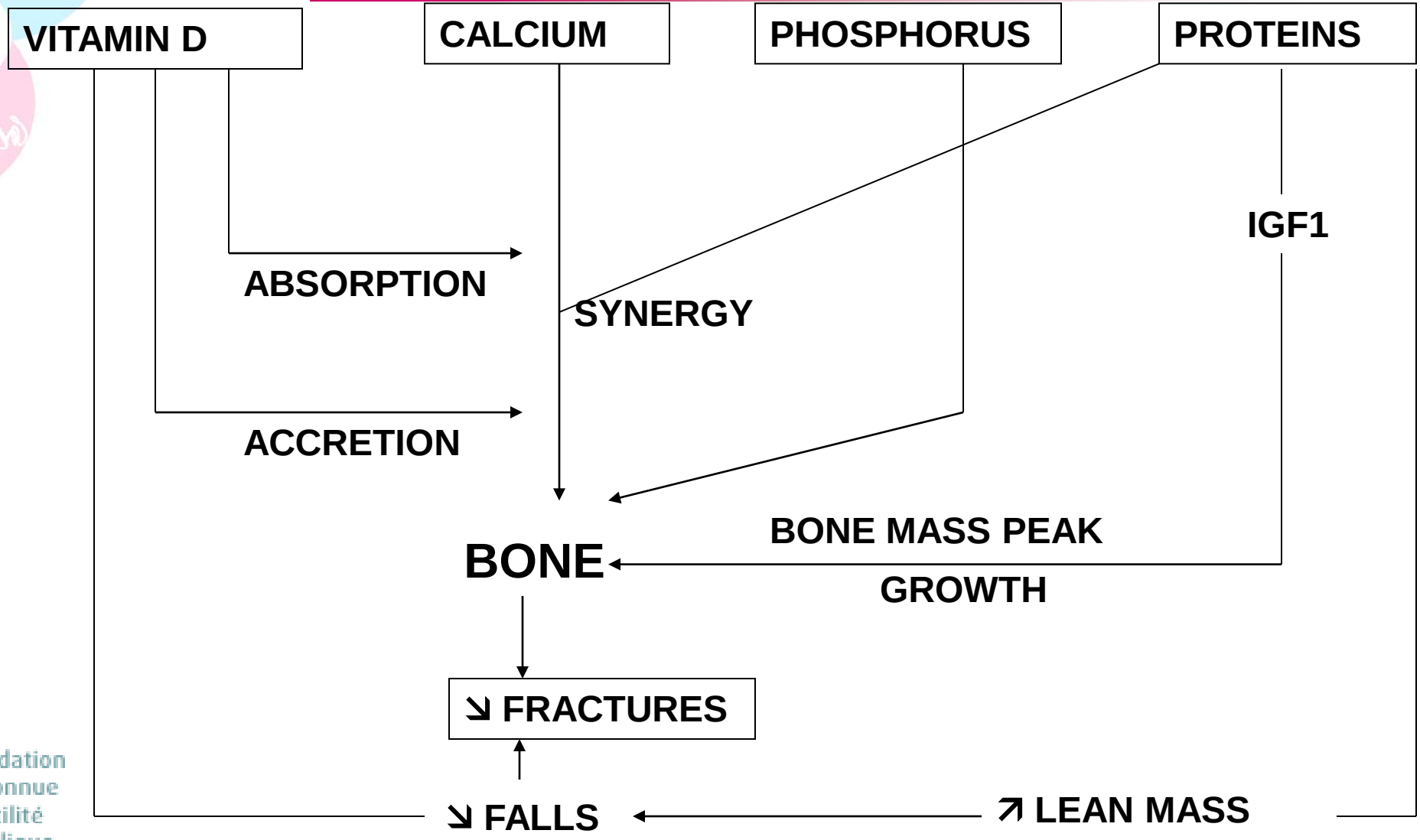
SOME FACTS

DAIRY PRODUCTS AND CANCER

WORLD CANCER RESEARCH FUND AND AMERICAN INSTITUTE FOR CANCER RESEARCH AND OTHERS STUDIES SINCE 2007

	COLORECTAL	PROSTATE	BLADDER	FOLLICULAR LYMPHOMA AND MULTIPLE MYELOMA
MILK	↘	?	↘ (?)	↘
CHEESE	?			
FERMENTED MILK PRODUCTS			↘	
DIET VERY HIGH IN CALCIUM		↗		

DAIRY PRODUCTS AND OSTEOPOROSIS



DAIRY AND CARDIOVASCULAR DISEASE

DESPITE THAT 60% OF THE FAT PHASE OF DAIRY PRODUCTS IS SATURATED FATTY ACIDS

ALL EPIDEMIOLOGICAL STUDIES SHOW THAT DAIRY PRODUCTS (MILK – FERMENTED, MILK AND YOGURT, CHEESE) CONSUMPTION IS NOT ASSOCIATED WITH AN INCREASE OF CVD INCIDENCE OR CORONARY HEART DISEASE INCIDENCE, BUT WITH NEUTRAL EFFECT OR DECREASE OF THAT INCIDENCE

EVEN IN JAPAN CARDIOVASCULAR DEATH

9243 male and female

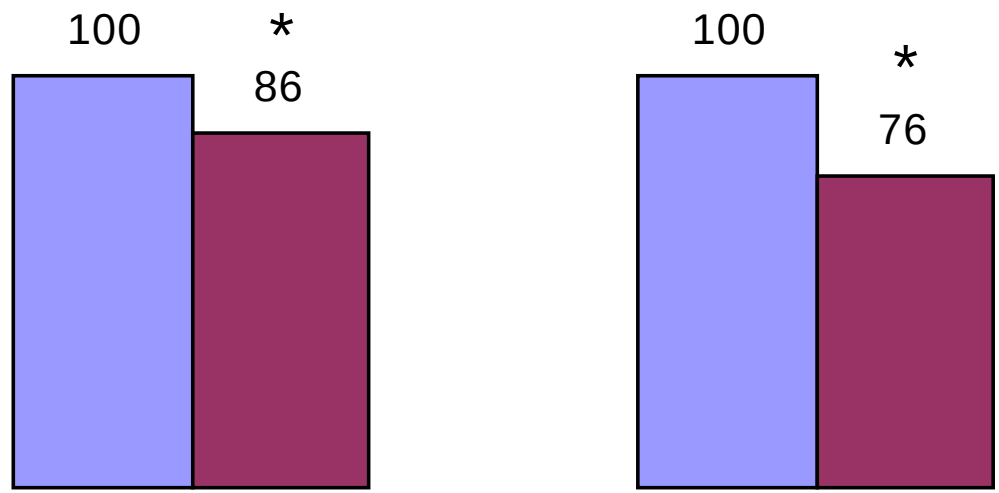
> 30 years old

Follow-up : 24 years

AFTER ADJUSTMENT ON CONFOUNDERS

FEMALE

* FOR EACH 100g MILK INCREASED CONSUMPTION



J Epidemiol 2013

EVEN IN CENTRAL AMERICA MYOCARDIAL INFARCTION

CASE CONTROL STUDY (MYOCARDIAL INFARCTION = CMI) OF 3630 COSTA RICA ADULTS

FATTY ACID BIOMARKERS IN ADIPOSE TISSUE (C15:0 and C17:0)

→ NO INCREASE OF MI

FOOD FREQUENCY QUESTIONNAIRE

↓

DECREASE OF THE RISK OF NON FATAL MI

FOR THE Q2 – Q3 – Q4 – Q5 QUINTILES OF DAIRY PRODUCE INTAKE

↓ ↓ ↓ ↓

-28% -26% -33% -17%(NS)

COMPARED TO THE LOWEST QUNTILE (Q1) OF DAIRY PRODUCT CONSUMPTION

Nutr Metab Cardio Vasc Dis 2012, 22, 1039-45

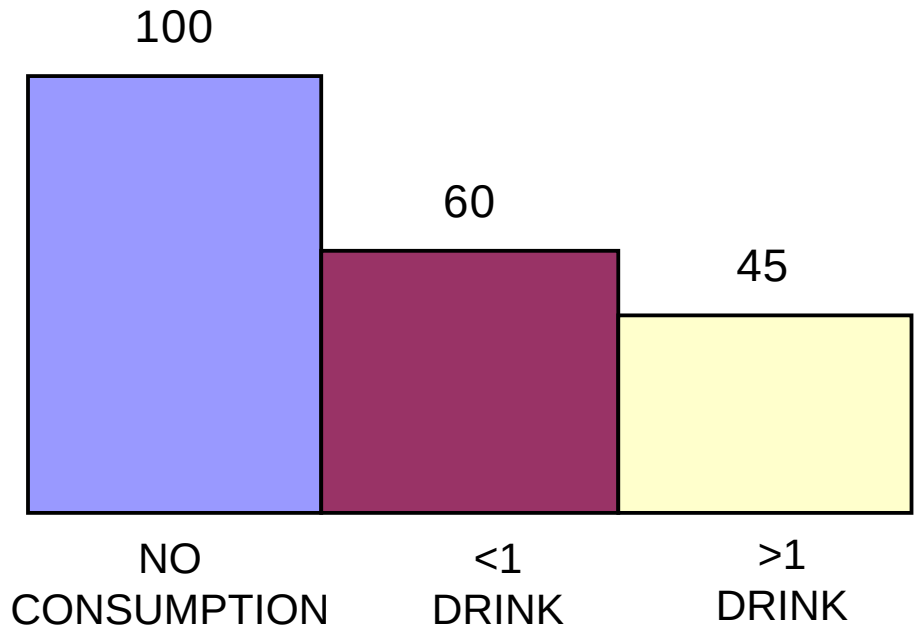
EVEN IN FRANCE MORTALITY

MONICA STUDY

897 french people (45 – 65 years old)

Follow-up 14 years

MORTALITY



Bongard V

OR IN THE NETHERLANDS
DEATH DUE TO STROKE

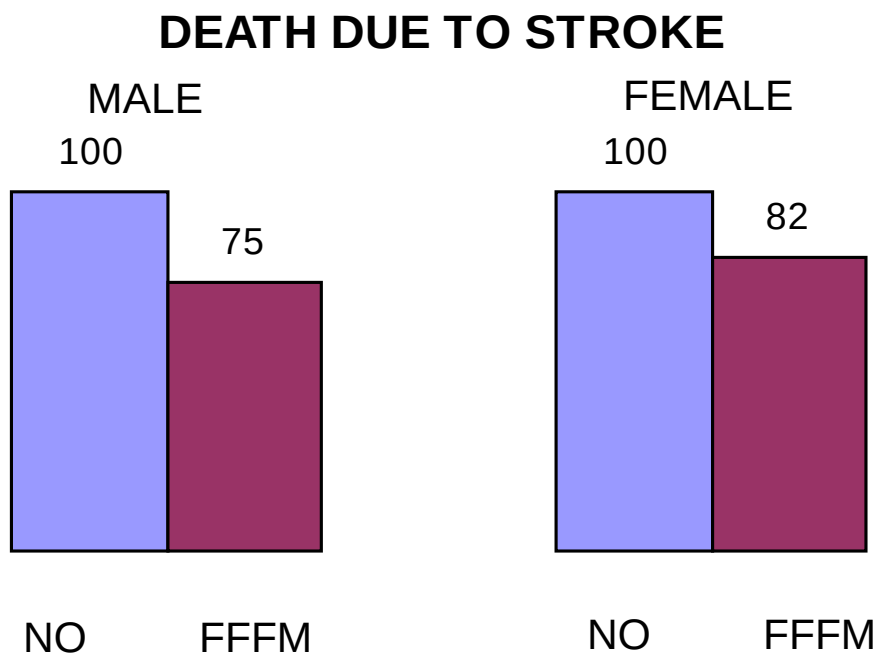
120 852 male and female

55 – 69 years at baseline

10 years follow-up

Food Frequency Questionnaire

FFFM = Fermented Full Fat Milk

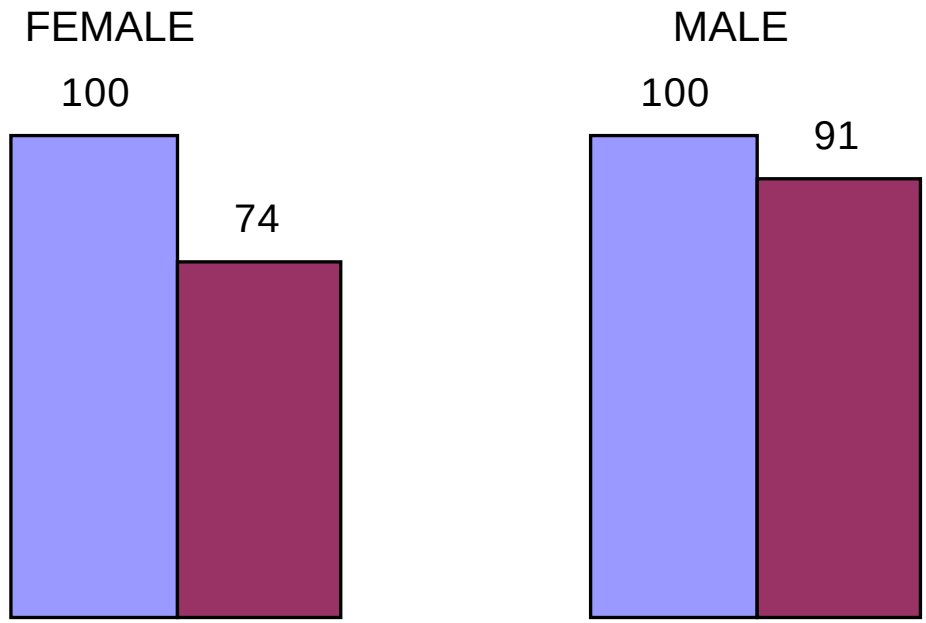


AJCN 2011, 93, 615-27

OR IN SWEDEN
RISK OF FIRST MYOCARDIAL INFARCTION

CASE (444) – CONTROL (558) STUDY (FIRST MYOCARDIAL INFARCTION)

SERUM MILK FAT BIOMARKERS (C15:0 – C17:0)



REMAINED SIGNIFICANT AFTER ADJUSTMENT FOR CONFOUNDERS OR = 0,74

MOREOVER QUARTILES OF REPORTED QUARTILES OF CHEESE (M+F) AND FERMENTED MILK PRODUCTS WERE INVERSELY RELATED TO A FIRST MI ($p<0,05$)

AJCN 2010, 92, 194-202

IN THE ELDERLY
NOT TOO LATE
NOT ONLY AGAINST OSTEOPOROSIS

1080 women aged > 70 y in PERTH-AUSTRALIA

FOOD FREQUENCY QUESTIONNAIRE

COMMON CAROTID ARTERY INTIMA – MEDIA THICKNESS (CCA – IMT) 3 years later

→ YOGURT CONSUMPTION WAS NEGATIVELY ASSOCIATED WITH CCA – IMT AFTER ADJUSTMENT p 0,015

PATIENTS WHO CONSUMED > 100g YOGURT/d HAD A SIGNIFICANTLY LOWER CCA – IMT THAN DID PARTICIPANTS WITH LOWER CONSUMPTION (AFTER ADJUSTMENT) p0,003

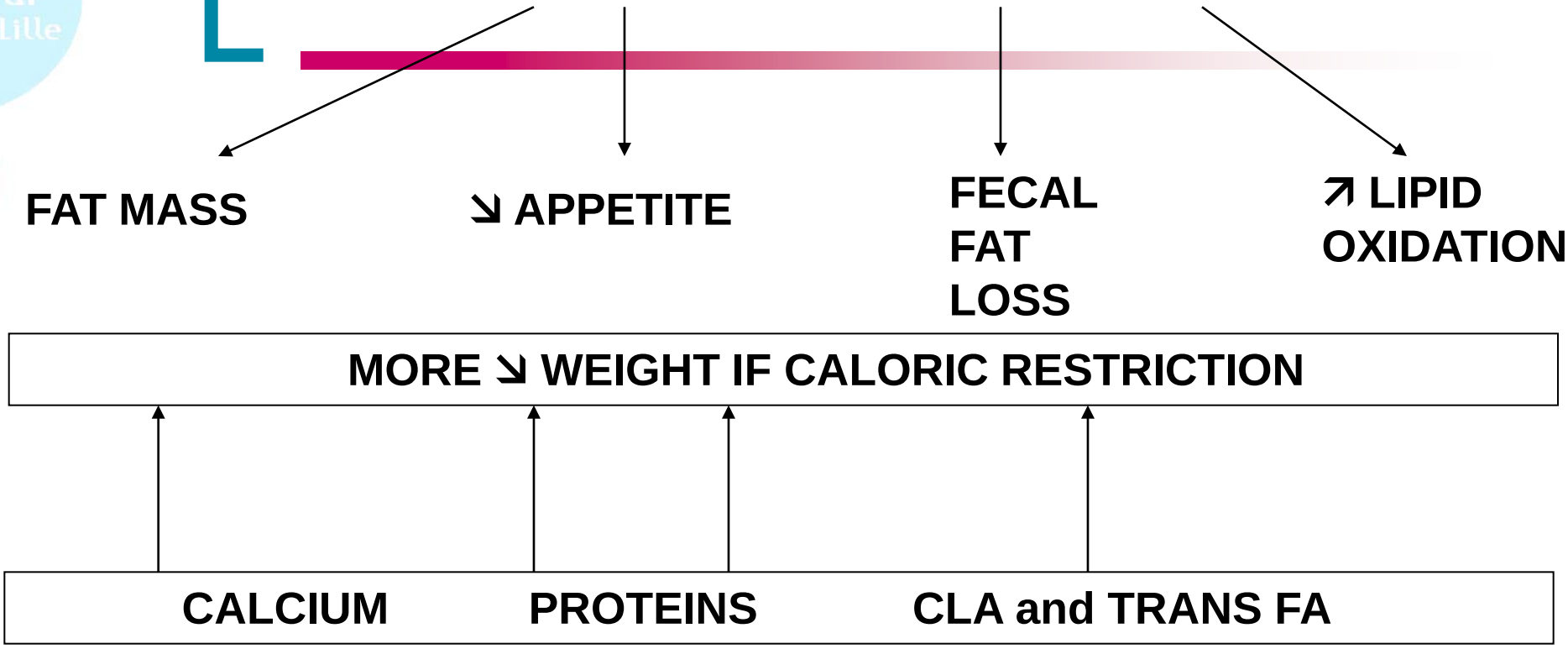
AJCN 2011, 94, 234-9

WHY ?

BECAUSE OF PROTECTIVE NUTRIENTS AGAINST CARDIOVASCULAR RISK IN DAIRY

→ CALCIUM	EFFECTS ON WEIGHT CONTROL CHOLESTEROL
→ MILK-DERIVED BIOACTIVE PEPTIDES	BLOOD PRESSURE
→ SPECIFIC FATTY ACIDS RUMENIC ACID	VISCERAL FAT AND WAIST CIRCUMFERENCE
→ PROBIOTICS	INFLAMMATION AND MICROBIOTA
→ LACTOSE	GLYCEMIC INDEX

DAIRY PRODUCTS AND WEIGHT



Br J Nutr 2009, 101, 659-663
Br J Nutr 2011, 105, 133-143
EJCN 2012, 66, 622-7
EJCN 2012, 66, 1104-1109

DAIRY PRODUCTS AND METABOLIC SYNDROME THE D.E.S.I.R STUDY

5212 SUBJECTS

Follow6up 9 years

INVERSE RELATIONSHIP	● INCIDENT METABOLIC SYNDROME ● DIASTOLIC BLOOD PRESSURE ● TRIGLYCERIDES	IMPAIRED FASTING GLYCEMIA	TYPE 2 DIABETES	BMI GAIN	● WAIST CIRCUMFERENCE INCREASE ● TRIGLYCERIDES
DAIRY PRODUCTS (EXCEPT CHEESE)	X	X	X	X	
DIETARY CALCIUM DENSITY	X			X	X
CHEESE	X			X	X

DAIRY FOOD INTAKE AND DIABETES

5582 subjects > 25 years

Follow-up : 5 years

- MEN CONSUMING > 1,9 DAIRY SERVINGS / day

→ ≈ 50% DIABETES OCCURRENCE

/ COMPARED TO THOSE CONSUMING < 0 – 1,2 Servings/day

- WOMEN NON SIGNIFICANT REDUCTION

Pub Heath Nutr 2012,

DAIRY PRODUCTS AND DIABETES

WOMEN'S HEALTH INITIATIVE STUDY

82076 post menopausal women

8 y of follow-up

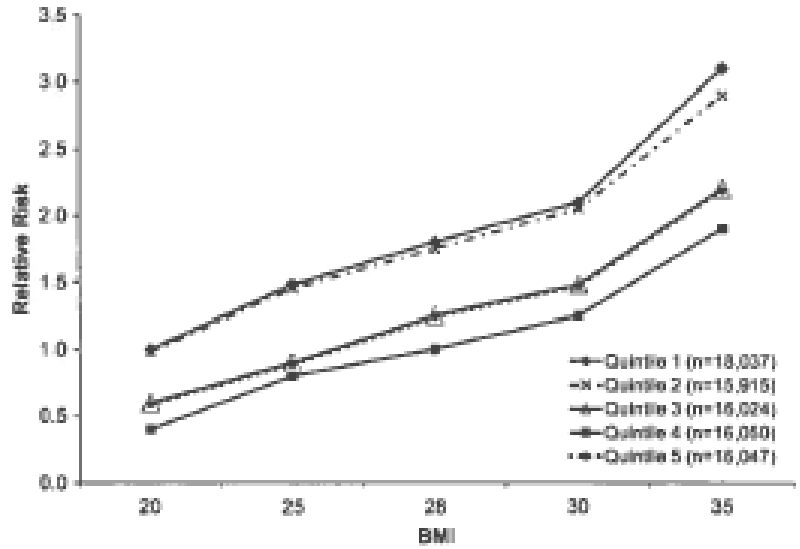


FIGURE 1 RR of incident diabetes in postmenopausal women by quintile of low-fat dairy product intake at various levels of BMI.

MORE IN WOMEN WITH A HIGHER BMI

HIGH YOGURT CONSUMPTION ++

J Nutr 2011, 141, 1969-1974

SELF PERCEIVED LACTOSE INTOLERANCE IS ASSOCIATED WITH HYPERTENSION AND DIABETES

CROSS-SECTIONAL STUDY

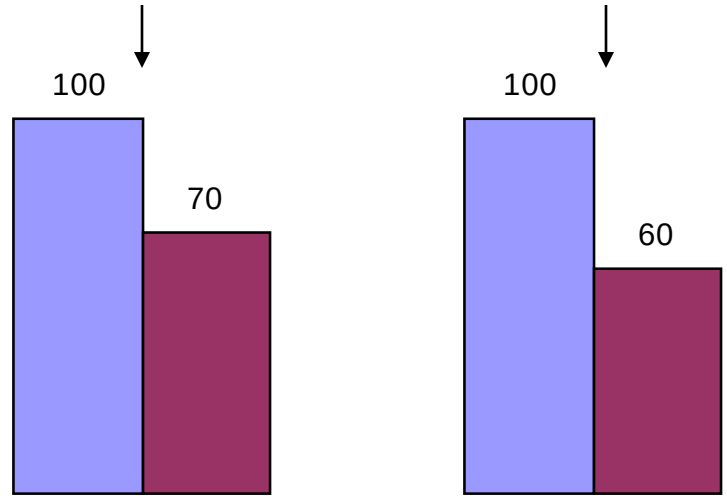
3452 ADULTS

12,3% PERCEIVED THEM SELVES TO BE LACTOSE INTOLERANT

HAD SIGNIFICANTLY LOWER (p <0,05) AVERAGE DAILY CALCIUM INTAKES FROM DAIRY FOODS

HIGHER PERCENTAGE HAVING PHYSICIAN DIAGNOSED DIABETES AND HYPERTENSION

For a 1000 mg increase in calcium intake from dairy foods per day



AJCN 2011, 94, 191-8

OVER ALL AGES

ENFANT	CHILDREN	ADOLESCENT	ADULTS	ELDERLY
GROWTH	GROWTH	GROWTH		
		WEIGHT CONTROL	WEIGHT CONTROL	
DIETARY DIVERSITY	DIETARY DIVERSITY	DIETARY DIVERSITY	DIETARY DIVERSITY	DIETARY DIVERSITY
		OSTEOPOROSIS	OSTEOPOROSIS	OSTEOPOROSIS
			DIABETES AND METABOLIC SD	DIABETES
			CARDIOVASCULAR DISEASE	CARDIOVASCULAR DISEASE
			CANCER	CANCER
				SARCOPENIA

THE NUTRIENT RICHNESS OF MILK AND DAIRY PRODUCTS

- NEARLY A COMPLETE FOOD WITH ALMOST
  - ALL MACRONUTRIENTS
  - ALL MICRONUTRIENTS

  ESSENTIAL FOR LIFE
- THE NATURAL FOOD WHICH HAVE THE MOST NUTRIENT DIVERSITY

  AMONG ALL HUMAN AVAILABLE FOOD

  FOR EXAMPLE GREAT DIVERSITY OF FATTY ACIDES WITH

  ABOUT 400 KINDS OF FATTY ACIDS NOT ONLY

  SATURATED FATTY ACIDS

THE NEW MATRIX EFFECT

NOT ONLY THE SUM OF ITS NUTRIENTS

BUT ALSO THE NEW MATRIX EFFECT

→ **FAVOURABLE INTERACTIONS**

↓

EXAMPLES

BONE METABOLISM	**WEIGHT CONTROL**	**CARDIOVASCULAR FUNCTION**
Vitamin D	**Calcium**	**Calcium**
Calcium	**Proteins**	**Fatty acids (CLA)**
Phosphorus	**CLA**	**Probiotics (yogurt)**
IGF1		**Bioactive peptides**
Proteins		**Vitamin D**

CONCLUSION (1)

DAIRY PRODUCTS ARE VERY GOOD SOURCES AND LOW COST SOURCES OF MANY MICRONUTRIENTS

MOREOVER THEY HAVE FAVORABLE EFFECTS ON WEIGHT MANAGEMENT, METABOLIC SYNDROME, COLORECTAL CANCER INCIDENCE, BONE HEALTH

CONCLUSION (2)

DAIRY PRODUCTS ARE USEFUL FOR HEALTH AND NUTRITION AT ANY AGE

NOT ONLY FOR CHILDREN

NOT ONLY FOR OSTEOPOROSIS

MILK AND DAIRY PRODUCTS ARE NOT ONLY ABLE TO CONTRIBUTE TO THE RECOMMENDED DIETARY ALLOWANCES WHATEVER AGE BUT THEY HAVE AN INCREDIBLE NUTRIENT RICHNESS, ARE NUTRITIONS BY NATURE, AND THEY HAVE A SPECIFICITY THROUGH THE MATRIX EFFECT