CALCIUM INTAKE DURING PREGNANCY

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INTRODUCTION

- Calcium is the most abundant mineral in the body
- 99% stored in bones
- Finely tuned homeostatic control mechanisms are required to maintain constant blood levels (PTH,Calcitonin,Vit D)

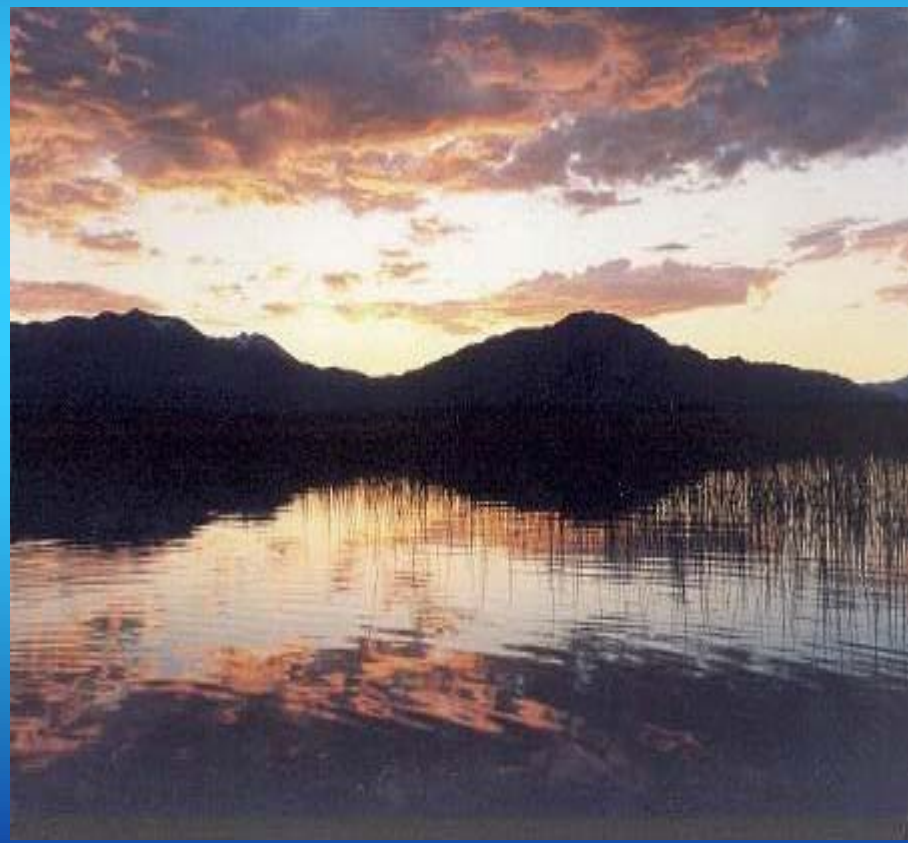
REQUIREMENTS

Dietary reference intake values for Calcium for US and Canada (1997)

Life stage	Mg/d	Life stage	Mg/d
0-6 m	210	51-70 y	1200
6-12 m	270	>70 y	1200
1-3 y	500	Pregnancy	
4-8 y	800	<=18 y	1300
9-13 y	1300	19-50 y	1000
14-18 y	1300	Lactation	
19-30 y	1000	<=18 y	1300
31-50 y	1000	19-50 y	1000

Calcium and Pregnancy

- High calcium requirements
- Maximal accretion rate in third trimester
- Skeleton of newborn contains 20-30gr



Potential negative consequences of deficiency in calcium intake during pregnancy.

Hypertensive Disorders

Bone Metabolism

Fetal Growth

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Bone Metabolism

- Calcium absorption and urinary excretion are higher during pregnancy
- Plasma markers of bone resorption are elevated
- After delivery, calcium absorption and urinary excretion are normal
- No data demonstrates that pregnancy causes a permanent negative effect on bone density

Hypertensive Disorders

- Eclampsia, preeclampsia and pregnancy induced hypertension may be associated with calcium metabolism
- Several RCTs of calcium supplementation during pregnancy had been carried out with uncertain results
- Cochrane Systematic Review suggests that calcium supplementation may be beneficial in pregnant women with high risk or low calcium intake

Fetal Growth

- Poor nutrition during pregnancy
  - may reduce neonatal bone density
  - may affect neonatal size
- Calcium supplementation for prevention of Hypertensive disorders (Cochrane systematic review): 6 of 9 studies reported that birth weights were higher in the intervention group compared to controls

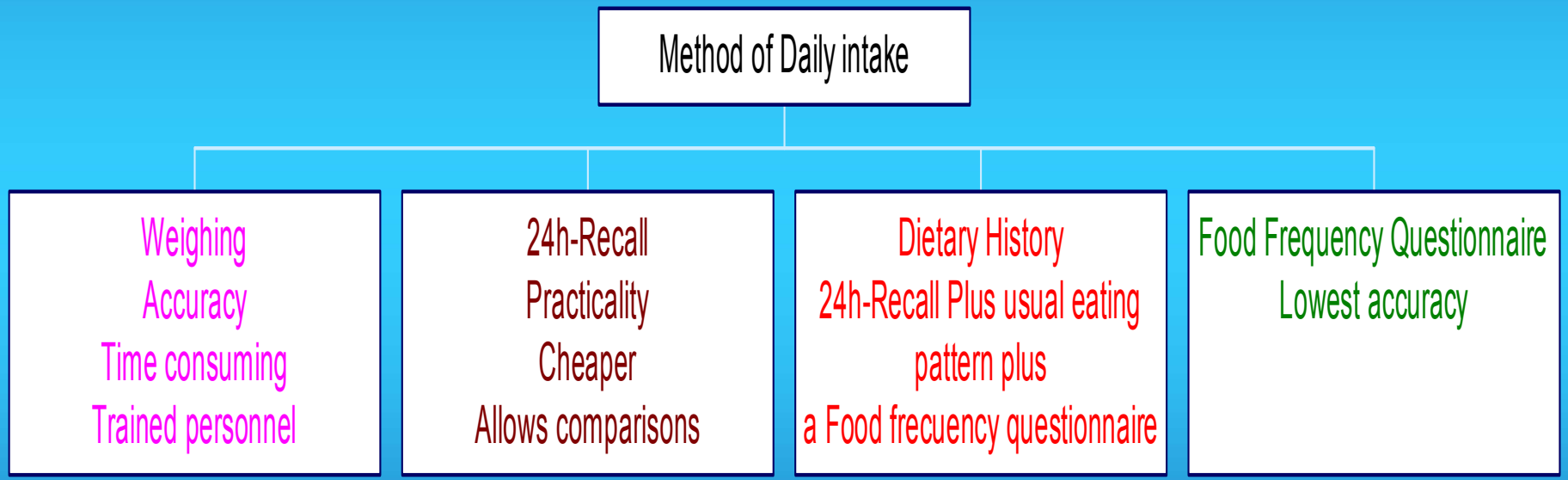
Objective

- Describe the usual intake of calcium during pregnancy in several populations from different countries

Materials and Methods

- Search strategy: Cochrane Databases, Medline and Ovid Gateway Database (1990-2003) were systematically searched
- Different types of studies were indentified: 5 Surveys; 2 Cross-sectional; 4 RCTs and 4 Longitudinal studies.
- 12 Full text articles
- 2 Abstracts
- 1 personal communication of an unpublished study

Method of Daily intake Assessment



RESULTS

- Africa
- Latin-America
- Asia
- Developed Countries

AFRICA

Reference	*Country*	*Study/ Method*	*Dietary calcium intake*
Prentice 1993	Gambia	Survey/ Weighing	404mg/d SD 133
Nyambose 2002	Malawi	Survey/ Weighing	2nd 813mg/d SD980 3rd 640mg/d SD706
Oguntona 2002	Nigeria	Longitudinal/ weighing	50.7% RDA Median 659.1mg/d

Latin-America

Reference	*Country*	*Study/Method*	*Dietary calcium intake*
Belizan 1991	Argentina	RCT/ 24h-Recall	Median 650mg/d
Lopez-Jar 1989	Ecuador	RCT/ No information	292mg/dSD126
Lopez-Jar 1997	Ecuador	RCT/ 24h-Recall	PL :605mg/dSD421 SUP :628mg/d SD302
Fitzgerald 1993	Guatemala	Survey/ 24h.Recall	727mg/dSD163
Bezerra 2002	Brazil	Cross sectional/ 24h-Recall	Median :500mg/d
Sacco 2003	Peru	Survey/ 24h-Recall	Median :430mg/d

Asia

Reference	*Country*	*Study/method*	*Dietary calcium intake*
Mohapatra 1990	India	Survey/ 24h-recall plus Standardized utensils technique	250mg/dSD49
An H. 2001	China	Longitudinal/ Not specified	47.7% RDA for Chinese population
Persson 2001	Indonesia	Longitudinal/ 24h-recall	1stT :316mg/dSD135 2ndT :360mg/dSD138 3rdT :380mg/dSD139

Developed Countries

Reference	*Country*	*Study/ Method*	*Dietary calcium intake*
Sanchez-Ramos 1994	USA	RCT/ Dietary history	PL:666.1mg/dSD225.6 SUP:630.2mg/dSD217.4
Rogers 1998	UK	Longitudinal/ Food F.Questionnaire	953mg/dSD286
Waiters 1998	Canada	Cross-sectional/ 24h-recall	Cau:1256mg/dSD577 Indian:750mg/dSD761 Inuit:670mg/dSD341

Conclusions

- Independent of the method used, the type of study or the country, the majority of the articles described a lower intake of calcium during pregnancy than the recommendation from the Food and Nutrition Board.

Conclusions

- The results showed some variation, ranging from very low intakes in India (250mg/d +/- 49) to higher intakes in Caucasian women in Canada(1256mg/d +/-577).
- This variation may be due to inconsistencies in the methodologies used to measure calcium intake and differences in socio-economic status.
- During pregnancy, diet changes a lot in some countries because of myths, variation in activities, appetite and self selected diet.

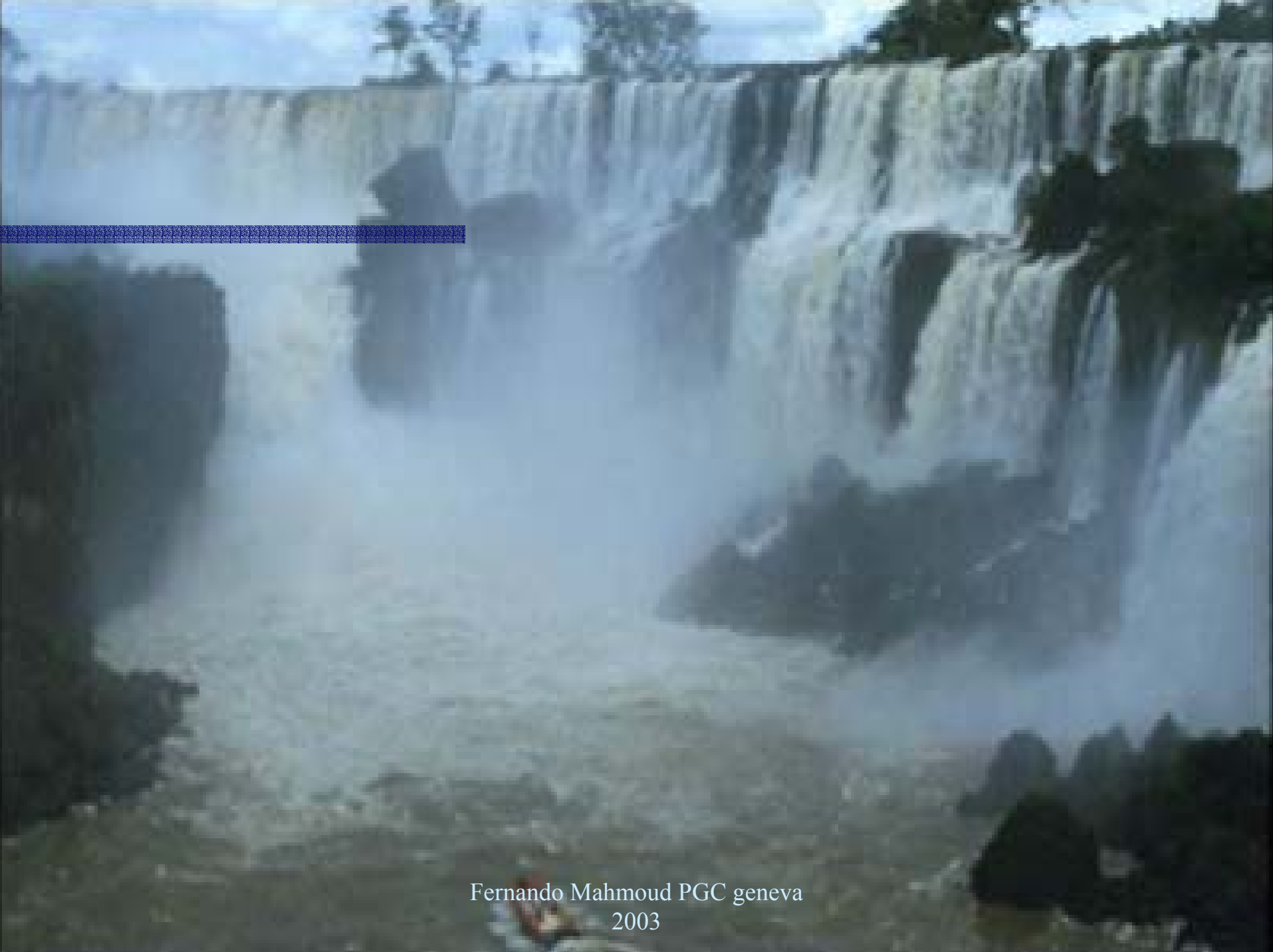
Implications for Research

- More investigation by surveys
- More research is needed to assess the potential negative effects of low calcium intake during pregnancy.

Implications for Programmes

- Make women aware about how deficient their calcium intake is
- Which is the best way to improve calcium diets:
  - **supplementation only during the pregnancy?**
  - **improving diet in the general population?**

Thank you !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