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## ABSTRACTS 19th International Congress of Nutrition

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## COMBINATORIAL METHOD TO GENERATE THOUSANDS OF MEALS RESPECTING NUTRITIONAL RECOMMENDATIONS

Darmon, Michel; Darmon, Nicole; Maillot, Matthieu  
Marseille, FRA

**OBJECTIVES:** A combinatorial analysis was developed to select a wide variety of nutritionally adequate meals by everyday users.

**METHODS:** From a list of 60 foods (10 entries, 10 main courses, 10 dairy products, 10 desserts and 10 vegetables), all the possible combinations (106) of meals were generated. Nutritionally adequate meals were then identified using the French recommendations for adults.

**FINDINGS:** Fish meals were more often winners than others, and meals based on nutrient-dense foods were more often winners than meals based on frequently consumed foods.

**CONCLUSION:** It is possible to reconcile the respect of a great number of nutritional constraints with a certain degree of free food choice. The possibility of a "à la carte" offers advantages: foods can be chosen according to taste, availability, price, etc.).

## IMPLEMENTATION OF A NATIONAL REPORTING SYSTEM FOR SNAP AND COMMON DIETARY GOALS

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**OBJECTIVE:** The U.S. Department of Agriculture (USDA) nutrition programs provide a food insecurity safety net for millions of Americans. These programs serve 1 in 5 Americans every year and are excellent channels for reaching children and low-income families and empowering them to make healthier choices. When these programs work together as collaborative, cross-program partners, nutrition education activities are magnified, efforts are coordinated, and the likelihood of achieving goals improves. State Nutrition Action Plans (SNAP) is a key USDA strategy for connecting nutrition education to the target population in ways that make a difference.

**OBJECTIVE:** To establish a cross-program SNAP in each State that focuses on the behavioral goal of national importance.

**BACKGROUND:** In 2003, USDA initiated the SNAP process by convening cross-program staff from each of the 50 States at a national meeting. These meetings initiated the SNAP process to identify a common goal and develop an action plan to achieve that goal together. The SNAP process includes joint planning, program development and implementation of interventions and monitoring. More than 49 States, Washington, DC, and Puerto Rico, have implemented a SNAP. Two national and six regional cross-program nutrition conferences provided facilitated discussions and training on cross-program initiatives. States are creating locally-based SNAPs to deliver "core nutrition messages" to maximize the impact and reach of the program.

**CONCLUSIONS:** SNAP has helped harness the power of these programs and disseminate consistent messages that support achievement of nutrition goals.

## DEVELOPMENT OF A NATIONAL REPORTING SYSTEM FOR SNAP AND COMMON DIETARY GOALS

Blum-Kemelor, Donna<sup>2</sup>; Singh, Anita<sup>3</sup>; Lockett, Alice<sup>2</sup>; Walker, Melissa<sup>2</sup>; Merrick, Maura<sup>2</sup>

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**OBJECTIVE:** The Supplemental Nutrition Assistance Program (SNAP) is the largest federal nutrition program, currently serving about 31 million people in the United States. SNAP is the nation's first line of defense against food insecurity and provides resources for food as well as nutrition education (SNAP-Ed) to assist consumers in making healthier food choices. All States offer SNAP-Ed and the total funding is over \$350 million. SNAP-Ed's rapid growth, concerns about

diet-related diseases and need for greater accountability, prompted the agency to establish a uniform national report.

**OBJECTIVE:** The Education and Administrative Reporting System (EARS) was designed by the Department of Agriculture (USDA) to obtain uniform data and information about SNAP-Ed activities to inform national management and policy decisions.

**METHOD:** USDA used a collaborative process by establishing a workgroup of diverse experts and partners to develop EARS. Development required over 4 years and included: an assessment of existing reports; developing content; field-testing; public comment and clearance, training, implementation and monitoring. The process allowed several opportunities for both informal and formal review and input from stakeholders.

**RESULTS:** EARS was implemented in federal fiscal year 2008. It captures demographic characteristics of SNAP-Ed participants as well as the type and amount of education delivered, and information about behavioral goals, educational strategies and content, venues used for SNAP-Ed and resources expended.

**CONCLUSION:** EARS provides information that is useful to policy official and nutrition professionals. EARS data supports the planning process at the national, state and local levels and provide clearer pictures of SNAP-Ed services.

## P130-27

### INTENSIVE NUTRITION THERAPY ELICITS POSITIVE BEHAVIORAL CHANGES IN CORFIS PATIENTS IN MALAYSIA

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**RATIONALE:** Diet and exercise are cornerstones in chronic disease management.

**OBJECTIVE:** To evaluate a 6-month dietitian care of patients attending CORFIS clinics.

**METHOD:** A multicenter trial involving Intervention (n=101) and Control (n=137) patients with any/ combination of hypertension, diabetes and hyperlipidemia on standard therapy. Stages of Change model was used in evaluation.

**RESULTS:** Only Intervention patients showed positive outcomes after 6 months in relation to improved knowledge scores (p<0.001), regular exercise (p<0.001) and weight changes (p<0.01). Further:

- Blending cooking oils to achieve desired P/S ratio was targeted in hyperlipidemic (from 13% to 59% by 6 months). This paralleled changes in TC (↓11.5%; within group p<0.001, between group p<0.05, LDL-C (↓16.0%; within group p<0.001; between group p>0.05), TG (↓16.9%; within group p<0.05; between group p>0.05) and HDL-C (↑2.5%; within group p>0.05 between group p<0.05).

- In diabetics, carbohydrate control (74.6 to 95%), sugar reduction (84 to 97%) and regular meal timings (46.9 to 79%) decreased HbA1c (15.4%; within group p<0.001; between group p<0.05) and fasting glucose (16.9%; within group p<0.01; between group p<0.05) levels.

- In hypertensives, changes in fruit and vegetable consumption (85 to 94%), avoiding salty foods (79 to 99%) and salt reduction (83.6 to 97%) caused lower systolic (7%) and diastolic (4%) pressures (within group p<0.01; between group p<0.001).

**CONCLUSION:** Intensive dietetic therapy elicited positive outcomes in chronic disease management.

## P130-28

### KNOWLEDGE, ATTITUDE AND FATHER'S ROLE IN EXCLUSIVE BREASTFEEDING PRACTICE IN SOUTH JAKARTA AREA, INDONESIA

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Breastfeeding is a common feature of all cultures because the survival of mankind depends on it. The use of colostrums and duration of breastfeeding has varied between cultures, demographic, and socio-economic factors. The present cross-sectional study aims to study the influence of knowledge, attitude and father's role in exclusive breastfeeding practice in South Jakarta area of



## KNOWLEDGE, ATTITUDE AND FATHER'S ROLE IN EXCLUSIVE BREASTFEEDING PRACTICE IN SOUTH JAKARTA AREA, INDONESIA

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### ABSTRACT

Breastfeeding is a common feature of all cultures because the survival of mankind depends on it. The use of colostrums and duration of breastfeeding has varied between cultures, demographic, and socio-economic factors. The present cross-sectional study aims to study the influence of knowledge, attitude and father's role in exclusive breastfeeding practice in South Jakarta area of Indonesia. Questionnaire data from 60 mothers and fathers pairs were obtained. Results of the study show that exclusive breastfeeding practice is associated with mothers' and fathers' knowledge about breastfeeding ( $p < 0.01$ ). On the contrary, exclusive breastfeeding practice is not associated with father's role in breastfeeding practice ( $p > 0.05$ ). Using multiple logistic regression analysis, mothers with middle education level background and family with high income level are risk factors for exclusive breastfeeding practice. They are more likely to practice non-exclusive breastfeeding that must be an important part in breastfeeding education programs and exclusive breastfeeding promotion. In conclusion, education programs for father are needed to give better knowledge about the role of father in exclusive breastfeeding practice.

*Key words: breastfeeding, father's role, Indonesia, Jakarta,*

The efficacy of breast-feeding in lowering infant morbidity during the first year of life is well recognized<sup>(1-4)</sup>. Factors affecting a woman's decision to breast- or bottle-feed have been previously assessed.<sup>(5,6)</sup> This research has shown that although fathers participate in choosing the feeding method for their newborns and can be effective promoters of breast-feeding, they are not routinely included in most prenatal breast-feeding education programs. As a result, fathers may not be prepared to offer needed support and help to breast-feeding mothers.<sup>(7)</sup> Fathers' attitudes regarding breast-feeding have not been evaluated in prenatal studies to explore possible differences between those who express plans to have their child breast-fed and those who plan to have their child bottle-fed.

The purpose of this study is to determine the attitudes of expectant fathers regarding breast-feeding. If negative attitudinal factors and misperceptions about breast-feeding exist among fathers, educational programs that include fathers can be developed to address these issues.



## MATERIALS AND METHODS

### *Subjects*

The subjects were 60 expectant mothers and fathers registered in hospitals in South Jakarta area serving mostly middle to upper-middle socioeconomic class population. All participants had medical insurance that covered maternity and childbirth costs. Each was involved in a pregnancy classified as "low risk".

### *Questionnaire*

The questionnaire was designed to require no more than 15 minutes to complete. It consisted of both demographic and attitudinal questions. In the demographic portion, subjects were asked to check the box for each category that best described themselves. A Likert scale (1 through 5) of response was used for the attitudinal portion.<sup>(8)</sup> There were no requests for written words from any subject. Application of the Gunning-Fogg index placed the questionnaire at the 4.7 grade level.<sup>(9)</sup> Validity and reliability assessments in the use of a Likert scale were performed on 25% of the total respondents. These assessments method has been described previously.<sup>(6)</sup>

### *Data Collection*

During the first session of childbirth preparation classes, fathers were invited to participate in an anonymous survey examining their attitudes about infant feeding. If they agreed to participate, they were given a questionnaire by researcher to complete individually.

### *Data Analysis*

Data were analyzed in several phases. Initially, a general frequency distribution for all items was obtained. Analysis of missing data revealed the consistent pattern or bias of item nonresponse to individual questions.  $\chi^2$  Analysis was then performed to measure the significance of the association between expected feeding method (breast, bottle, or both) and each independent attitudinal and demographic variable.



## RESULTS

Demographic analysis of the participants is summarized in Table 1. Fifty-eight percent (n=35) reported that their partners planned to breast-feed exclusively (BF) immediately after birth, 15% (n=9) planned to formula-feed exclusively (FF), and 27% (n=16) planned to do both (BO).

Several significant differences existed between the BF group and those in the FF and BO groups. Overall, the fathers in the BF group were more knowledgeable and had more favorable attitudes about breast-feeding. Fathers in the BF group were more likely to know that breast-feeding helps protect an infant from diseases and that breast-feeding helps with mother-infant bonding. All statistically significant attitudinal variables are listed in Table 2.

The majority of men in all groups (BF, FF, BO) believed that breast-feeding was not acceptable in public (BF = 71%, FF = 78%, BO = 88%;  $P < .05$ ).

## DISCUSSION

The parental decision-making process regarding choice of feeding method for newborns is multifaceted. Familial and professional supports are important factors in both the rates of initiation and eventual duration of breast-feeding.<sup>(10)</sup> Increased rates of both have been associated with fathers' support of lactation.<sup>(11)</sup>

Although most private hospitals offer childbirth preparation classes (or some variation thereof) for expectant parents, the amount of class time spent on infant nutrition and feeding choice is highly variable. Most of the hospitals in our study offered an additional "one-session short course" on breast-feeding, but only expectant mothers were actively encouraged to attend. We hypothesized that variations in support for breast-feeding among fathers might be due to a lack of information or the harboring of negative cultural perceptions.

Our data demonstrated many significant attitudinal differences among groups of fathers depending on their planned preferred method of infant feeding. Fathers who intended to have their children bottle-fed overwhelmingly perceived negative results occurring to their wives from breast-feeding and were unaware of the benefits to their child. Fathers are known to play a



significant role in the decision about infant-feeding method.<sup>(6)</sup> These fathers would presumably have a non-supportive or even negative outlook toward breast-feeding and could be expected to discourage their partners from attempting to initiate lactation.<sup>(12)</sup>

Table 1. Responses to Demographic Questions

<i>Variable</i>	<i>%</i>	<i>number</i>
<i>Educational background</i>		
High School	8	4
University	82	50
Postgraduate	6	3
Other	4	3
This was a planned pregnancy	77	46
Smoke cigarettes	10	8
Discussed feeding plan with spouse	90	54

Table 2. Significant Attitudinal Variables

1. Breast-feeding is not natural
2. Breast-feeding is acceptable in public
3. Breast-feeding helps protect a baby from diseases
4. Breast-feeding is bad for breasts
5. Breast-feeding is better for the baby
6. Breast-feeding interferes with sex
7. Think highly of women who breast-feed
8. Breasts were made for breast-feeding
9. Breast-feeding helps with bonding
10. Less attracted to spouse/partner if she breast-feeds

Subjects for this study were chosen from childbirth coaching classes in private hospitals as this provided an opportunity for the convenient enrollment of large numbers of fathers. We presumed that fathers attending classes of this type with their partners would have greater involvement in childbirth preparation relative to the general population. As rates of breast-feeding have decreased over the last 5 years, we thought that this population was worthy of study and concern regarding this issue. Presumably, these subjects are better medically informed as demonstrated by their health information-seeking behavior manifested by attendance in these classes. Our results, therefore, represent a 'best-case' scenario of the general population. If this is



true, significant gaps exist in the education of men in all segments of society regarding breast-feeding, and this could easily lead to further decline in breast-feeding rates in all social strata.

Currently, fathers are expected and encouraged by health care professionals to offer support to their partners regarding the decision to breast-feed. However, it is unrealistic to expect fathers to intuitively possess background on the nature of breast-feeding and its benefits to infants. Few opportunities exist for fathers to prepare themselves to offer helpful and needed support to breast-feeding mothers. We recommend that fathers be included and actively solicited for participation in all breast-feeding education courses currently taught in hospitals. Innovative approaches to increase participation in prenatal care, education, and nutrition are all needed.

In conclusion, fathers can play an important role in helping to increase rates of breast-feeding in this country. <sup>(14)</sup> Their inclusion in already established forums for breastfeeding education would be simple and could have a positive impact.

#### REFERENCES

1. Cunningham AS. Morbidity in breast-fed and artificially-fed infants. *Pediatr.* 1977;90:726-729
2. Cunningham AS. Morbidity in breast-fed and artificially fed infants II.1. *Pediatr.* 1979;95:685-689
3. Fergusson DM, Horwood U, Shannon FT, et al. Breast-feeding, gastrointestinal and lower respiratory illness in the first two years. *Aust Paediatr* 1981;17:191-195
4. Leventhal JM, Shapiro ED, Aten CB, Berg AT, Egerter SA. Does breastfeeding protect against infections in infants less than 3 months of age. *Pediatrics.* 1986;78:896-903
5. Bloom K, Goldbloom, Stevens FE. Factors affecting the mother's choice of infant feeding method. *Acta Paediatr Scand Suppl.* 1982;300:3-8
6. Freed CL, Jones TM, Schanler RJ. Prenatal determination of demographic and attitudinal factors regarding feeding practice in an indigent population. *Am J Perinatol*, 1986; 87:896-903.
7. Jordan PL Breastfeeding as a risk factor for fathers. *JOGN Nurs*, 1986; 15:94-97
8. Cuilford JP. *Psychiatric Methods*. New York, NY: McGraw-Hill; 1954
9. Gunning RA. *Techniques of Clear Writing*. New York, NY: McGraw-Hill; 1968
10. Switzky LT, Vietze P, Switzky HN. Attitudes and demographic predictors of breastfeeding and bottle-feeding behavior by mothers of six-- week-old infants. *Psychol Rep.* 1979;45:3-14
11. Bevan ML, Mosley D, Lobach KS, et al. Factors influencing breastfeeding in an urban WIC program. *J Am Diet Assoc.* 1984;84:563-567
12. Jordan PL, Wall VR. Breastfeeding and fathers: illuminating the darker side. *Birth.* 1990;17:210-213
13. Ryan AS, Lewandowski C, Krieger FW. The recent decline in breast-feeding, 1984-1989, Presented at the Annual Meeting of the American Public Health Association; 1990; New York, NY, Columbus, OH: Ross Laboratories.
14. deChateau P, Holmberg H, Jakobsson K, et al. A study of factors promoting and inhibiting lactation. *Dev Med Child Neurol.* 1977;19: 575-584



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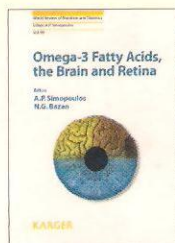
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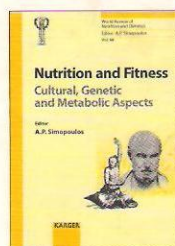
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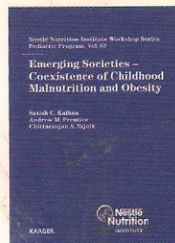
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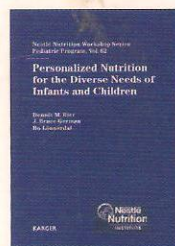
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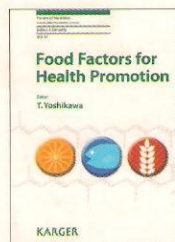
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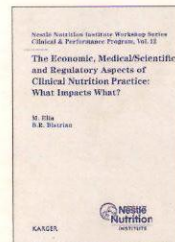
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