

Animal Source Foods to Improve Micronutrient Nutrition and Human Function in Developing Countries

Sociocultural and Household Factors Impacting on the Selection, Allocation and Consumption of Animal Source Foods: Current Knowledge and Application¹

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ABSTRACT This paper reviews the literature on cultural and household level constraints on the consumption of animal source foods (ASF). Food proscriptions do not appear to significantly limit food consumption in the areas where this question has been examined, with the possible exception of adult women in some settings. Preferential food allocation patterns, based on economic contribution, social valuation and other factors do play a role in limiting the intake of animal source foods for children and women in some settings. Economic factors limit access to ASF at the household level. Child care patterns in different cultural settings can also serve to enhance or limit the consumption of ASF. Social marketing and positive deviance approaches have had some success in increasing the intake of ASF by using formative research and participatory approaches. The paper concludes with a series of research questions for further investigation. *J. Nutr.* 133: 4036S–4041S, 2003.

KEY WORDS: • culture • households • food prohibitions • food allocation • animal source foods

This paper explores sociocultural and household factors impacting on the selection, allocation and consumption of animal source foods (ASF)³. The selection, allocation and consumption of all foods is highly regulated by social, cultural, environmental and economic factors. Yet we would argue that ASF tend to be among the most regulated across cultural settings. This regulation occurs at multiple levels, but we would also argue that most happens in the household. Importantly, the greatest number of limitations governing ASF tend to affect infants, young children, the sick, the elderly and women in different transitory states.

This manuscript outlines the main factors at the community and household levels that limit or enhance the consumption of ASF, and will emphasize the limits of our knowledge and understanding in these areas. The issue of application will be addressed by considering how this information has been incorporated into programs to improve the diet and nutritional status of peoples in diverse settings. The review closes with some discussion of what works to increase the consumption of ASF in marginal populations and in specific subgroups. Finally, areas for future research are outlined.

¹ Presented at the conference "Animal Source Foods and Nutrition in Developing Countries" held in Washington, D.C. June 24–26, 2002. The conference was organized by the International Nutrition Program, UC Davis and was sponsored by Global Livestock-CRSP, UC Davis through USAID grant number PCE-G-00-98-00036-00. The supplement publication was supported by Food and Agriculture Organization, Land O'Lakes Inc., Heifer International, Pond Dynamics and Aquaculture-CRSP. The proceedings of this conference are published as a supplement to *The Journal of Nutrition*. Guest editors for this supplement publication were Montague Demment and Lindsay Allen.

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³ Abbreviations used: ASF, animal source foods; SES, socioeconomic status; VAD, vitamin A deficiency.

Figure 1 presents a conceptual framework illustrating some of the main themes in this paper. The framework describes the flow of food through the household, with an emphasis on animal source foods.

The literature, and various presentations at this conference, present ample evidence to support the impact of ASF on the nutrition and health status of marginal populations around the world (1). A few main points should be stressed: 1) animal source foods even in relatively small quantities can make a significant difference in the nutritional health of children and adults; 2) increased ASF intake is linked to many different types of health outcomes; and 3) ASF represent dietary quality and diversity. Access to ASF, even in relatively small amounts, can lead to improvements in health and nutritional status. These findings exist even when controlling for economic factors. Two households of similar low economic status can produce members with very different nutritional status, and these differences are often related to the selection, allocation and consumption of foods. As an example of this, in rural Nepal we examined the sociocultural and behavioral determinants of vitamin A deficiency (VAD) in young children (2). Even when controlled for socioeconomic status (SES), more frequent consumption of animal source foods differentiated controls (children with no history of xerophthalmia) from cases (children with a past history of xerophthalmia). This association was not seen with frequency of consumption of plant-based sources of β -carotene. Animal source foods made the difference, and they did so independently of SES.

The question remains, why do some households of similar economic circumstances experience deficiency and others do not? Part of the answer lies in what happens inside households and inside people's minds (e.g., their culture).

Conceptual framework: ASF flow through the household

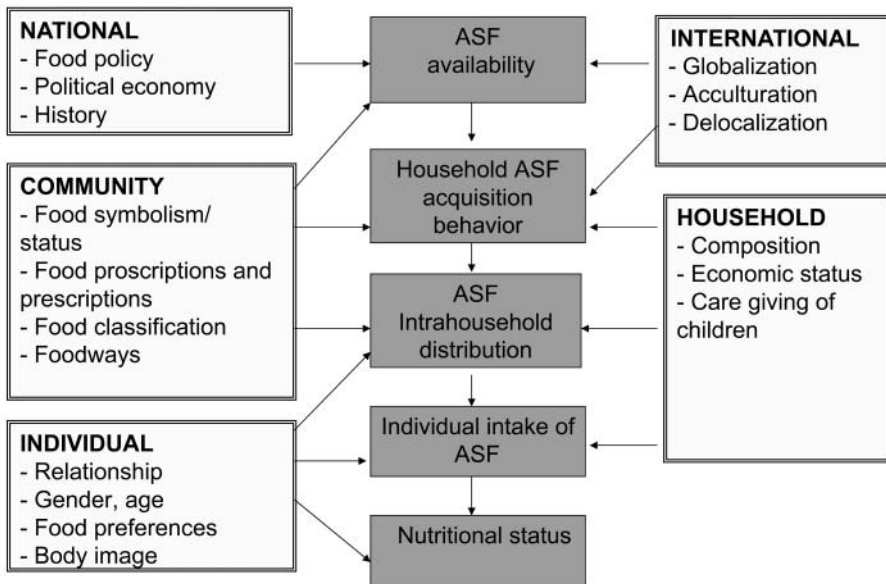


FIGURE 1 Conceptual model: animal source food flow through the household.

A few notes on culture

From one perspective, culture may be defined as the set of rules and norms that are used to guide behavior of a group of people. Culture is shared and transmitted from one generation to another. The primary locale for this transference is the household. Many anthropologists have argued from this kind of culturally deterministic perspective, where culture was seen as sort of an inviolate template—a rulebook for human behavior. This perspective has altered in the past 20–30 y; now there is increased recognition that human behavior is based on material (economic, historical) concerns and genetic factors. Now cultural systems are seen by many to be only part of what influences human behavior, and they are viewed as dynamic and changeable (3).

Food classification

Every cultural setting maintains multiple concepts about how foods should be categorized. These systems of categorization, in turn, are commonly invoked when making decisions about food selection, preparation, serving and consumption. We are all familiar with many of these systems: hot-cold, light-heavy (referring to the digestibility of these foods), high status-low status, junk-healthy, pure-impure, high fat-lowfat and so on, and may refer to certain of them ourselves. Food classification systems describe inherent qualities of foods, which are often viewed as making a particular food appropriate or inappropriate for consumption by subgroups.

Food proscriptions and prescriptions

Cultural rules and systems relating to food selection, allocation and consumption commonly take the form of food proscriptions and prescriptions, in other words, foods that are to be avoided or preferentially consumed by all or by segments of a cultural group. Specific food proscriptions and prescriptions are often generated from broader cultural systems, such as food classification systems, ethnoanatomical and ethnophysiological concepts, and ethnomedical models of health and illness.

There are two main types of food prohibitions, permanent and transitory. Most of us are aware of some of the permanent bans on selected animal flesh foods, such as pork and beef, maintained by specific cultural and religious groups. These types of bans tend to be inviolate. Those who transgress may be subject to group sanctions. Consumption of these foods is part of what distinguishes “us” from “them,” and to consume the food may lead to disinclusion from the group. The other type of food proscriptions is transitory, and is applied to individuals within a cultural setting due to specific phase states, such as illness, pregnancy, postpartum, lactation and so on. Food prescriptions, the favorable allocation of certain foods to individuals in certain transitory states, are also quite common and may counterbalance negative effects of transitory food prohibitions. For example, in Nepal, postpartum women are thought to be in a cooling state, and so avoid cooling foods, such as water buffalo meat. On the other hand, they are preferentially fed chicken and other kinds of heating foods (4). Animal source foods, particularly the flesh of certain animals, tend to be the most commonly prohibited foods (3,5).

Our experience has been however, that there are very few foods that are totally off limits due to food classification rules. In Nepal’s terai region, our informants stated as a general rule that young children should not eat hot foods in the hot season. Many foods, about one-third, are categorized as hot in this setting. With further exploration, the statement was qualified by respondents to mean a small number of specific very hot foods (6). In fact, even these foods could be cooled (and thereby be made digestible) by soaking them in cool water. Therefore, there are the rules, but there are also the rules for modifying or breaking the rules. This fact is important in understanding how people actually behave regarding food, and in planning intervention strategies around food.

What do these food rules actually mean in terms of diet and nutritional status? Although there has been considerable work describing culture-based constraints such as food prohibitions on the consumption of foods, including ASF, the evidence establishing the relationship between food prohibitions, actual diet and nutritional status is limited. A study of early childhood undernutrition in Uganda found no impact of food taboos on child nutritional status (7). In the terai of Nepal, we found no

association between the food beliefs of mothers and VAD in their children (6).

In rural Nigeria, the majority of women ignore food taboos that place them at a disadvantage and engage in a series of additional coping strategies that result in improved dietary intake (8). A similar pattern has been observed for Lese women in the Congo (9). Among Brazilian women, food prohibitions for various physiological states have little impact on nutritional status (10). On the other hand, in the Nepal hills, we looked at the relationship between food restrictions for women during phase states, and the relative frequency of consumption of categories of foods (2). It appeared that lactating, menstruating, pregnant and postpartum women were less likely to consume key foods, in a manner consistent with existing food proscriptions. However, it is difficult to tease out the impact of food restrictions for women based on food prohibitions, from restrictions based on preferential allocation in this setting.

We conclude that, overall, food proscriptions and prohibitions of ASF per se play a limited role in determining nutritional status at the population level and may play some role in micronutrient deficiencies of women in different phase states. This lack of impact of food prohibitions on actual diet has been mentioned by other investigators (11). Laderman (12) observed that food ideology, like other systems of belief, is subject to interpretation, justification and change. What exists is a series of normative rules that are often invoked as part of posthoc explanations of illness or negative outcome, but may actually have limited influence on intake.

Household dynamics and preferential food allocation

Households are the locus for the expression of cultural values relating to food. A form of actual rules with more substantive impact than food prohibitions, preferential food allocation includes distribution patterns based on differential valuation of certain household members over others. Preferential food allocation includes favoritism of males over females, adults over children and other patterns of preferential treatment within the household.

Patterns of valuation of adult men over women have been found in Nepal (13), Bangladesh (14), China (15) and the Philippines (16). Multiple studies investigating gender differences in the allocation of food to children have shown conflicting results. No differences were found in Nepal (13,17), the Andes (18,19) and Mexico (20). However, Frongillo and Bégin found preschool-aged males were favored over females in Guatemala (21). Chen (22) found male children favored over female children in Bangladesh based on dietary recalls, although this was denied by the mothers.

Age-based differences in intrahousehold food allocation do appear to exist, but the form differs from setting to setting. In Nepal, I found evidence of preferential treatment of young children over adults (13); this was corroborated by Panter-Brick (23), also in Nepal. Two studies in Peru (18,19) found that children were shown preference over adults in times of food scarcity. On the other hand, the pattern is reversed in other cultural settings. Children were found to be disfavored for nonstaple foods in Mali (24,25). Elders were favored in terms of food over children in urban Nigeria (26). In the Marshall Islands, a third of the households have at least one obese adult and one undernourished child, indicative of substantial disparities between ages (27).

Preferential food allocation on the basis of age or gender is hypothesized to be based on the differential valuation of specific household members. This valuation has been linked in the literature to the current or future, perceived or actual,

economic contribution of the individual (15,28), as well as to their social valuation (19).

Although the majority of the literature on determinants of differential food allocation relies on an economic-contributions concept (29), intensive work in communities reveals a more complex picture, where social relationships, power and status play a role. Graham's work in Peru and my own in Nepal reveals that parents nurture children for noneconomic reasons, including companionship, affection and social value (4,19). Howard and Millard's (30) ethnography of child undernutrition in Tanzania demonstrates that there is often a social story or explanation behind many cases of child undernutrition. Poverty plays a large role of course, but expression of undernutrition in marginal economic settings can be directly affected by the breakdown of social relationships.

A key factor in understanding patterns of differential food allocation within households is identifying the types of foods that are allocated. In most settings where differential allocation does occur, it does not happen in the case of staple foods (2,15,24,25). Foods that are differentially allocated tend to be luxury foods (nonstaple foods), such as ASF, rather than necessity foods (staple foods) (31). Foods that are in short supply tend to be more commonly used to establish and reinforce the status of certain household members.

Child care practices

Child care practices can also play a role in determining children's access to ASF. Ethnoparenting refers to the style of child care and parenting practices associated with particular cultural groups. Ethnoparenting includes feeding styles (active or passive), attention to hygiene and sanitation, grooming, affection, quality and amount of supervision and other aspects of interaction. Many of these components of parenting styles are associated with the diets and nutritional status of children in different cultural settings (27,32). In particular, active feeding and care of children is associated with higher quality diets and better nutritional status in many settings around the world (27,33,34).

Economic factors

It is undeniable that economic status at the household level is tied to access to ASF. This has been shown in numerous studies. On the other hand, a few investigators have found no difference in food consumption when comparing children from families of different socioeconomic backgrounds (35,36). At the household level, economic factors play a large role in determining access to ASF, as do cultural factors that limit access to raising certain kinds of livestock. Cultural factors play a large role in how that food is allocated to specific household members, particularly in terms of marginal households, where the supply of ASF is limited.

Application: increasing the consumption of animal source foods by all household members

A number of approaches have been used with some success to increase the consumption of ASF in marginal households. It should be noted that this often requires altering social and cultural norms, which are notoriously difficult to change, or at the very least, working within these norms. In this section of the article we will focus on social marketing and similar mass media approaches and positive deviance approaches. These approaches are not mutually exclusive by any means. However,

they do differ in their targets and approach to using cultural norms, such as food prohibitions.

Social marketing approaches. Social marketing has been defined by Andreasen (37) as, “the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of society.” A strength of the social marketing approach is an emphasis on formative research, which permits inclusion and adaptation of intervention approaches to specific cultural contexts. The approach has built-in processes to understand (segmentation) and reach (channel selection) specific target audiences.

One social marketing strategy is to take a food-centered approach to promote specific ASF. A social marketing campaign was able to increase serum retinol levels in Central Java, Indonesia by focusing on the promotion of eggs (38). Egg consumption increased in all socioeconomic groups and the increase in serum retinol was related to egg consumption. The authors note that at least half of the success of the campaign in Central Java can be attributed to the promotion of eggs. In Burkina Faso, investigators using social marketing of red palm oil were able to see improvements in vitamin A intake (39).

In developing social marketing strategies to increase consumption of ASF, there is a need to understand the dynamics of household power and decision making. For example, in settings where younger women are disfavored, leading to poor pregnancy outcomes, older women who do wield some power might be convinced that their future security lies in feeding daughter-in-laws well.

Food-centered social marketing interventions do have some significant downsides. Due to their focus on a few selected foods, there may be circumstances when promotion of those specific foods is not advisable. One food or even a few foods may not match all situations. Another potential weakness is a heavy emphasis on identifying and working with selected specific behaviors, which may lead to inattention to broader contextual factors.

Positive deviance approaches. Positive deviance approaches have been used in a number of settings to improve child nutrition in developing countries (40). Based on the observation that children in some households are well nourished in settings with high levels of child undernutrition, this approach seeks to identify and promote behaviors that characterize such positive deviant households. Positive deviance has had some success identifying specific local ASF, particularly wild foods, which can make a difference (40,41). Intervention approaches developed using positive deviance principles have been successful in improving infant feeding practices, particularly by increasing the consumption of ASF, in Vietnam, Nepal, Haiti and Bangladesh (40,41).

Positive deviance approaches operate under the reasonable assumption that if some households are performing a given healthy behavior, it is probably culturally acceptable and economically feasible for other households to perform the behavior. This assumption would hold true if we are speaking of relatively immutable cultural norms or rules, but might be less true where food allocation is based on differential valuation of individuals within the household or specific social circumstances. Thus, the reason small children may get eggs in one household and not another may have less to do with the acceptability of giving your children eggs, and more to do with the composition (e.g., status of household members) of the two households. On the other hand, cultural systems are dynamic, and arguably meant to change with new circumstances, to be renegotiated by individuals and groups.

This gives us hope for change within households and cultural settings.

What works?

Considering these approaches and others for improving diet and nutritional status, what are the lessons learned? What works, and how are animal source foods part of the solution? A common theme across these different approaches is that culture counts, and should be addressed. It is important to understand cultural systems, the “rules” for each cultural setting. Specifically, it is crucial to know the most salient systems of food classification, food proscriptions and prescriptions, the system of valuation of people and how this is implemented in a given setting, with particular relevance to animal source foods. It is important also to understand that these rules are part of a dynamic process. We need to learn how to take this process into account in our planning.

A second theme is the appropriate incorporation of cultural information into educational approaches. However, there is little agreement and a great deal of diversity on how best to work within different cultural settings. There are multiple ways to work within specific cultural settings, including the use of countermessages (or demarketing), acknowledgment of cultural influences on health beliefs and practices and different forms of working within the existing cultural framework. As Resnicow and others (42) have observed, there are at least two levels at which public health practitioners can address cultural issues, surface and deep structures. At the surface, interventions, programs and approaches are adapted to a particular setting, to make the material or information more acceptable. This may involve using characters, locations, jargon, food and clothing familiar to persons in a cultural setting. We would argue that much of nutrition education takes this form.

Deep structure, as defined by Resnicow, “involves incorporating the cultural, social, historical, environmental and psychological forces that influence the target health behavior...” in a cultural setting. Cultural interventions that reach this deeper level resonate with people, and become salient and memorable. Interventions that can reach deeply tend to use culturally acceptable and common forms of communication, such as storytelling (43). Another example of this approach is the use of cultural metaphors (44,45), where concepts that people are already familiar with, such as agriculture, are used as a basis from which to communicate new information.

A third theme is that formative research is essential, and that it is crucial to incorporate this information from the very beginning (46). Formative research is needed to assess existing cultural concepts relating to food, but also relevant audience segments and channels for reaching them, and to determine acceptability of ASF. It matters through whom and how the message is delivered. We are likely to see greater success using existing/preferred communication methods, presented by local communicators acknowledged for their authority, as part of existing institutions.

A fourth theme is the importance of working with the entire household. As I have related, household dynamics, including the differential valuation of some household members over others, play a substantial role in constraining the consumption of animal source foods. In many settings, like Vanuatu, men bring home the majority of animal source foods, so intervention programs should appeal to and include other household members beyond the mother child dyad. Household/family approaches that have been particularly effective include home visiting, which permits programs to target at-risk segments

of the population and adapt interventions to specific circumstances. Other programs have focused on including grandmothers and other elders who have a lot of decision-making authority (47). A key limitation to household-targeted approaches is economic, as a way to reach households in a cost-effective manner has yet to be identified.

A final theme is related to participation. Participatory approaches such as Participatory Rural Appraisal, Participatory Action Research and others have gained increasing credence as an appropriate and effective means of involving communities in addressing their health concerns. Each of the approaches we have discussed thus far includes some component of participation, but certainly could further involve communities. Community participation leads to a deeper understanding of the topic at hand and builds rapport with community members, facilitating the development of a culturally appropriate intervention, and one more likely to be sustained.

Future research questions

The work presented leaves us with several productive areas for further investigation:

1. What is the actual impact of food prohibitions on actual diet and nutritional status? The evidence thus far is limited and favors a small impact, but additional work could clarify both who are the most vulnerable to food prohibitions and how best to renegotiate their application in different cultural settings.
2. What are local concepts of dietary diversity or the need for dietary diversity? Local notions of what constitutes a diverse and complete diet often differ substantially from the perspectives of nutritionists. Better understanding of these concepts will aid greatly in developing nutrition education approaches that are more likely to succeed.
3. Under what circumstances do people begin to reinterpret their existing food ideologies? It is important, particularly in the area of food prohibitions, to develop a clear understanding of when existing patterns might be renegotiated and when we should stay away. Generally, permanent prohibitions should not be addressed, but even renegotiating the rules around transitory prohibitions must be done with great care.
4. Does incorporating cultural information into nutrition intervention really make a difference? There is very little work done comparing culturally adapted and nonculturally adapted approaches. It is assumed that culturally appropriate approaches will be more effective. An important follow-up question is, how deep do we need to go? Surface-level adaptation of materials to enhance acceptability and recognition might be sufficient to lead to behavioral change. Culturally deep intervention approaches tend to require more formative research, be more complex to implement and be less transferable to other settings.
5. We need intervention trials in household settings to demonstrate the impact of food-centered interventions using animal source foods. Many of the negative impacts of childhood malnutrition happen in the first two years of life and are difficult if not impossible to reverse later. Effective household-level interventions are essential. However, these face many challenges. A primary concern is whether or not the food will be allocated equitably within the household. If not, how can we encourage appropriate allocation to those most in need?
6. How can households be encouraged to consume the ASF they produce? The answer lies in understanding the local

context better, including notions of how and what children and women should be fed.

7. How do we deal with the twin problems of undernutrition and overnutrition? Of particular concern for nutrition education is how to deal with these problems when they occur in the same household, as is increasingly common in many settings.

In conclusion, we have described some of the major sociocultural and household-level factors that play a role in limiting (or enhancing) the consumption of ASF. Although people in different cultural settings frequently describe a series of food-related systems and normative "rules" for what people should or should not eat, they often already possess the "rules for breaking the rules." In addition, these rules are constantly being renegotiated by individuals. This knowledge can be used to our advantage to develop programs that are flexible and responsive to existing cultural systems, but also impact on behavior and health. Sociocultural rules that place greater valuation on certain household members over others are more complicated to address. This involves understanding and working within the deep structure of cultural settings. Understanding what motivates differential allocation patterns is the key to developing approaches for mitigating these effects.

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