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**WHAT CAN FOOD POLICY DO TO REDIRECT  
THE DIET TRANSITION?**

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### **Abstract**

The dietary transition in the developing world is accelerating toward an increased burden of chronic disease. It is increasing human mortality and disease burdens, and it is lowering economic productivity. The dietary transition is driven by changing preferences fueled by growing incomes, changing relative prices, urbanization, and food technology and distribution systems. This paper identifies policy options from the food supply and demand sides that can influence the transition toward increasingly healthy outcomes. These options have had mixed success in industrialized countries, and the policy trade-offs in the developing world will be even more complicated. Additional technical research is needed to assess competing risks and help develop policy options. There is also a need for research to engage different actors in the policymaking process. In a debate in which much is at stake, there is a potentially powerful role for researchers to bring these actors to the table. In the end, this may help improve the decisionmaking processes underlying food policies that aim to redirect the diet transition toward healthier outcomes.

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## 1. Introduction

In the twentieth century, the industrialized countries experienced a transition in disease burdens from acute forms of infection, such as tuberculosis to chronic diseases such as heart disease. Developing countries will not repeat this pattern in the twenty-first century. Instead, they will have to cope with the transition from acute disease to acute plus chronic disease—a double burden.<sup>1</sup> The two main contributors to this trend are diet and activity levels, both of which appear to be changing at historically rapid rates. This paper focuses on dietary changes. Where good data on food consumption are available, they show that the availability and intake of foods that are risk factors for chronic diseases—such as cardiovascular disease, diabetes, and some forms of cancer—are increasing rapidly in urban and rural areas and across all income groups. Increases in overweight and obesity rates in the developing world show similar patterns.<sup>2</sup> The coexistence of a double burden<sup>3</sup> of undernutrition and “overnutrition”<sup>4</sup> adds to human suffering and economic costs.<sup>5</sup> It also complicates the design of food policy.

This paper asks: “What can food policy do to redirect the transition in diets toward healthier outcomes?” The paper reviews the drivers of the changes in diet and the potential of both demand- and supply-side food policy options to influence the drivers.

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<sup>1</sup> See WHO 2002 and Ezzati et al. 2002.

<sup>2</sup> See Popkin 1998, 2001; Guo, Popkin, and Zhai 2000.

<sup>3</sup> See WHO ([www.who.int/nut/db\\_bmi.htm](http://www.who.int/nut/db_bmi.htm)) for data on coexistence of underweight and overweight and Garrett and Ruel (2003) for such coexistence in the same household.

<sup>4</sup> In a scientific sense, there is a lack of consensus on the definition of overnutrition. In this paper, the term is useful shorthand for excess consumption of added sugar, processed meats, red meats, starch from refined grains and potatoes, dairy products, trans isomers of fatty acids (found in partially hydrogenated vegetable oils found in some margarines and shortening), saturated fat, cholesterol, and overall calories—no matter the source—that leads to overweight and obesity. The term overnutrition is problematic in that it focuses on excess consumption of some diet components, but what is displaced from the diet by these unhealthy foods matters, too. In particular, the consumption of fruits and vegetables, nuts and pulses, poultry and fish, healthy oils and fats, and whole grains are thought to be health-promoting, and increased intakes should be encouraged (see WHO 2002, Willett and Stampfer 2002, and McCulloch et al. 2002).

<sup>5</sup> See Popkin, Horton, and Kim (2001) for estimates of these costs for some Asian countries.

The paper ends by highlighting the challenges posed to food policy design by the coexistence of—and linkages and trade-offs between—under- and overnutrition.

## **2. Drivers of Dietary and Nutrition Trends**

The commonly listed drivers of consumption trends include (1) income growth, (2) changes in relative prices caused by technology, institutional, and policy changes, and (3) the socioeconomic and activity changes associated with urbanization.

### **Income Growth**

As income grows, consumers want to diversify out of cereals and other starchy staples. The consumption of the poorest households tends to be most responsive to increases in income. At higher income levels, price tends to play less of a role in food choices. Data from the U.S. Department of Agriculture (USDA) (Regmi 2001) on how food expenditure responds to income increases (food expenditure-income elasticities) across a number of developing countries show that the poorest countries have the highest elasticities. Fish, then dairy, and then meats have the highest values, followed by fruits and vegetables, oils and fats, and cereals. However, over time, the elasticities may increase before they decrease. Data from China (Guo et al. 2000) show that the income elasticities for pork and oil increased between 1989 and 1993, and more so at the lowest income levels, especially for edible oil.

### **Relative Prices**

Basic economics tells us that if the relative price of a foodstuff increases, demand for it decreases. How have the relative prices of different foodstuffs changed over time?<sup>6</sup> Preliminary simple regression analysis of FAOSTAT's producer price series for Nigeria,

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<sup>6</sup> One price we do not examine here is the wage rate, which has risen for occupations that tend to be less physically demanding. A sedentary life style, of course, is the other side of the coin, but one that, for now, we ignore with respect to what food policy can do.

South Africa, and India did not demonstrate any significant systematic differences in relative price increases by food category. In China, however, oils low in saturated fats (soybean, sunflower, rapeseed, and sesame) posted significantly higher price increases over the 1976–95 period than palm oil, which showed one of the lowest price increases over the period. In the United States, the relative price of nonalcoholic beverages (dominated by carbonated sweetened soft drinks) dropped dramatically over the 1982–97 period, as have the prices of dairy products, fats and oils, eggs, meat, poultry and fish, and sugar and sweets (Putname and Allshouse 1999). Projections of the internationally traded prices for nonstaple, nonfruit, and nonvegetable goods, whenever available, indicate a further decline in their price relative to cereals (Delgado et al. 1999).

More analyses of past trends in producer and retail food prices need to be undertaken from a health perspective. For example, we do not have consumer food price trends by fat content or, preferably, by *type* of fat content. Such trends would help identify the main sources of any decline or increase in the price of fat or added sugar. Such information, as we will see, is important for policy formulation. In addition, more studies are needed that seek linkages between price trends and health outcomes. Many studies link undernutrition to price changes (Pitt and Rosenzweig 1986) but few link rates of chronic disease or obesity to relative price changes while controlling for a range of other factors. Two of the few such studies to do so using U.S. data suggest that 40 percent of the growth in weight of the U.S. population between 1976 and 1994 is due to technology-based reductions in food prices (see Lakdawalla and Philipson 2002 and Philipson and Posner 1999).

Technology innovation and policy may be one important source of change in the relative prices of foods that pose a chronic health risk; institutional policy changes is another. Examples of the institutional policy changes include (1) trade policy governance and (2) changing food distribution mechanisms. When China enters the World Trade Organization, many anticipate (e.g., Fang and Beghin 2000) that Chinese consumers will experience a 20 percent decline in the price paid of soybean oil and related products. More research is needed from a health perspective on how trade liberalization will affect



the price of different foods that represent different health risks. An illustration of institutional policy changes, fueled in part by technology changes, is the rapid transformation of food retailing in Latin America. Reardon and Berdegué (2002) report that the percentage of food distributed by supermarkets in retail outlets in the region grew from 10 to 20 percent in 1990, to 50 to 60 percent in 2000. This growth was driven by liberalization of financial flows and improved inventory management technology. These changes are also occurring in Asia and Africa (Reardon et al. 2003). Do these supermarkets increase the access of poorer consumers to more unhealthy processed foods (e.g., those with high levels of transfatty acids)? Do they also increase access to fresh fruit and vegetable products and other healthy diet components? What about those who do not use supermarkets? More research is needed to identify the trade-offs between healthy foods and healthy profits.<sup>7</sup>

### **Urbanization and Location**

Urbanization is proceeding rapidly in the developing world. Urbanization is marked by a reduction in physical activity for the majority of the labor force. The higher population density of urban areas lowers the per person cost of mass-media advertising, where the spending power of food manufacturers and processors surely outweighs that of public health authorities. The urban environment is also marked by a greater physical disconnect between places of work and residence and smaller household sizes, especially for women. In this environment, free time is scarcer, at least for those gainfully employed, and where the fixed costs of food preparation are higher in smaller families, more food tends to be purchased outside the home, even for poor households.

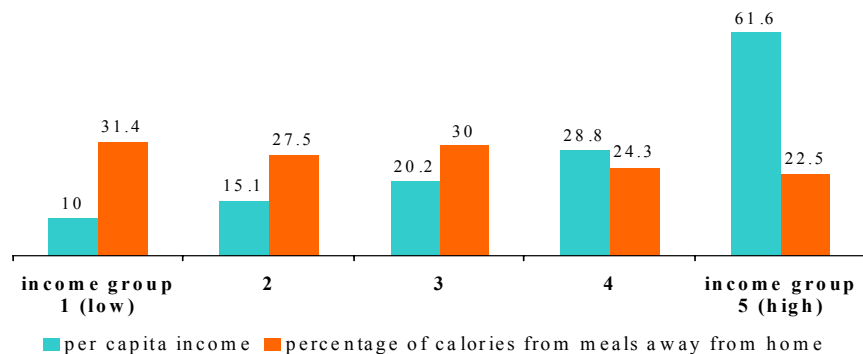
Foods purchased outside the home tend to be more processed, although good data from the developing world on this issue are hard to get. Such foods tend to be higher in salt and fat, and are often fried. Sometimes the frying oil has been used multiple times.

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<sup>7</sup> Reardon and Berdegué (2002) note that profit margins are highest on fresh fruit and vegetables—but also on dairy and processed foods.

This oil is particularly unhealthy because of its high concentration of transfat. These foods are often purchased from street vendors. Street foods are a significant source of food (and income) for many urban dwellers, both in terms of energy intake and food expenditure. In some settings, poorer urban dwellers may spend more of their food budgets on street foods than wealthier groups. A recent Accra-wide study (Maxwell et al. 2000) finds that households in the poorest expenditure quintile spend, on average, 39 percent of their total food budget on food purchased away from home, compared to 26 percent for the top quintile (see Figure 1).

**Figure 1—Calories from food away from home (percent of total), Accra 1997**

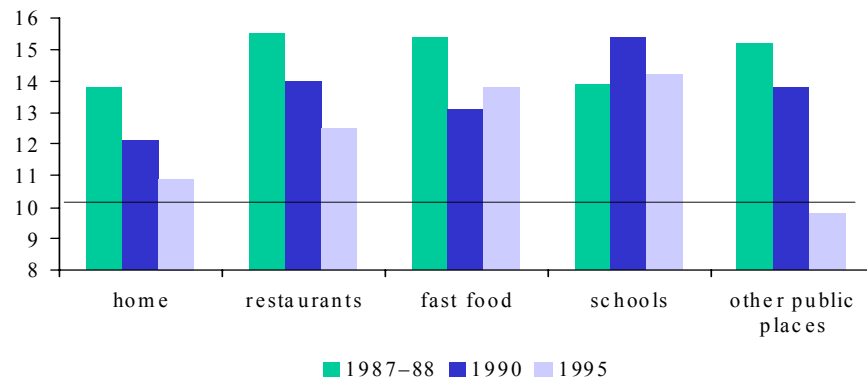


Source: Maxwell et al. 2000.

Tinker (1997), in her study of street foods in seven Asian and African countries, shows expenditures on street foods ranging from 16 percent in Manikgani (Bangladesh) to 50 percent in Ile-Ife (Nigeria), and higher street foods expenditures among poorest quartiles in both Bangladesh and the Philippines (Iloilo). Very little information is available on the contribution of street foods to the daily nutrient intake of consumers. In the Philippines, commercially prepared foods were found to contribute 25 percent of the

energy intake of urban workingwomen and 45 percent of their fat intake (Bisgrove and Popkin 1996). In the United States, data from the U.S. Department of Agriculture (USDA) (Lin, Guthrie, and Frazão 2000) show that the saturated fat content of foods consumed at home has dropped steadily over the 1980s and 1990s, whereas the fat content in fast food restaurants and in schools has remained high (see Figure 2).

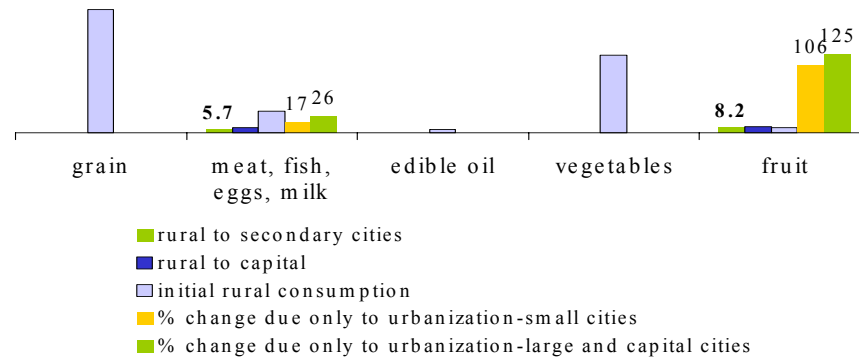
**Figure 2—Percentage of calories from saturated fats, by location of consumption, United States**



Source: Lin, Guthrie, and Frazão 2000.

Location clearly matters. But does location matter when price and income are controlled for? This is clearly shown to be the case in China (Figure 3), where food consumption shifts due to rural-to-urban migration were modeled, controlling for prices and income levels (Huang and Bouis 1996). In this case, urbanization seems to have led to a large increase, all things equal, in the consumption of fruit, a moderate increase in the consumption of meat, fish, milk, and eggs, and a moderate decline in the consumption of all other foods. Clearly one must take care when generalizing about the urban experience before more studies of this type are undertaken.

**Figure 3—Percent change in consumption of a rural-to-urban shift, controlling for income and prices, China 1991**



Source: Huang and Bouis 1996.

### 3. What Can Food Policy Do?

This section briefly reviews the rationale for public action to steer the diet transition toward greater healthiness: what is the case for public action? It then reviews options from the supply side (those that seek to influence the types of foods entering the food system) and from the demand side (those that seek to influence consumers' options and choices). The section then points out some of the trade-offs between addressing under- and overnutrition that are accentuated in developing countries. It ends with a short discussion of the political economy of public health policy in the area of food consumption.

#### The Rationale for Public Action

Table 1 summarizes the rationale for public action to influence the dietary transition toward a healthier outcome. Perhaps the most obvious rationale is information asymmetry between producers and consumers about what is healthy and what is not.

There may also be negative externality effects in terms of health-care resources being directed away from infants to middle-aged individuals and of the intergenerational transmission of obesity from mother to baby (see Parsons, Power, and Manor 2002). There will also be a case for public intervention if private-sector incentives result in poorer consumers being priced out of access to healthier food options, especially in the areas of basic processed foods. The point of this discussion is not to be exhaustive, but to remind the reader that any new area of proposed public action must rest on the broader principle of providing things that markets provide poorly.

**Table 1—The case for public policy intervention to reduce/improve diet quality**

<b>Rationale for public action</b>	<b>Example of broad area in which public intervention may be justified</b>
Underprovision of “public” goods	If generation of affordable healthy food is not available to poorer consumers
Externalities not captured	Negative externality if obesity of mothers is risk factor for child obesity Healthcare costs diverted from prevention
Information asymmetries	Case for providing healthy alternatives Case for labeling; nutrition education
Capital market failure	Investing in anti-LBW interventions
Universal access and equity concerns	Obesity is linked to more marginal groups in United States, United Kingdom
Health insurance market failure	Prevention and treatment of chronic diseases

### **Food Policy Options**

Options emanate from the supply and the demand side, although success will obviously be enhanced via the effective interaction of both. Table 2 summarizes the food policy options available to moderate dietary fat intake based on U.S. experience (see Sims 1998 and Ralston 2000). Although focused only on dietary fat and only on U.S. policy instruments, the table highlights several points. First, there are many stages in the food system where policy can act—both on the supply and demand sides. Second, many of the instruments may have small effects—either because behavior is hard to change in the desired direction or because there are some behavior changes that counterbalance desired changes in behavior (e.g., the extra servings of lower calorie foods maintain the

overall calorie intake from that source; see Sims 1998). This sobering conclusion should be kept in mind during policy formulation. Third, several instruments have ambiguous effects on fat intake—either because they have not been evaluated (e.g., harmonization of fat descriptors between regulatory agencies) or because their direct effects may be overwhelmed by their indirect effects (e.g., restrictions on beef imports may result in an overreaction from domestic beef producers and a search for new outlets for beef products). The table represents a menu of options, each of which needs to be evaluated if its impacts are to be maximized in the desired direction.

**Table 2—Food policy instruments for controlling dietary fat**

<b>Stage of the food system</b>	<b>Types of policy instrument</b>	<b>Examples used in the dietary fat issue</b>	<b>Effectiveness in controlling fat intake</b>
Food production	Commodity price subsidies/supports	Feedgrain subsidies for feedlot animals Dairy price supports	Negative Negative
	Import/export quotas	Export incentives for U.S. vegetable oil Restrictions on beef imports	Uncertain Uncertain
	Meat grading standards	Beef grading (changes from choice to select)	Positive
Food processing	“Standards of identity”	“Standards of identity” changed for low-fat milk and yogurt	Positive
	Food labeling	Food label descriptors (e.g., “low fat,” etc.) changed for fluid milk, ice cream	Quite positive
	Marketing orders for dairy	Changes in milk marketing orders	Negative
Food distribution and marketing	Food labeling	Use of “% lean” claims on ground beef Restaurant labeling of menu items with “low fat” claims	Slightly negative Slightly positive
	Food advertising	Harmonization between the FTC and FDA on ads using fat “descriptors”	Uncertain
	Food consumption	Food labeling	Fat descriptor information on food label
	Dietary information campaigns to public	Dietary guidelines Food guide pyramid	Positive Quite positive
	Commodity promotion boards	Promotion of cheese, ice cream, milk, beef, pork	Negative

Source: Adapted from Sims 1998.

### Supply-Side Interventions

- *More public investment in technology to deliver high-productivity, low-cost vegetables and fruits and low-fat livestock products to poorer consumers.* The bulk of agricultural technology development in high-value commodities such as livestock and fruits and vegetables tends to be undertaken by the private sector for

- larger farms. The high cost of cold chain systems reduces the possibility of their use by small farmers. Increasing the productivity of fruits and vegetables, lowering the fat level of livestock products, and reducing the transaction costs of delivering them to growing markets are important areas where research and development can have large health impacts.
- *Eliminate price incentives on growing high-fat foods and relax quantity restrictions on growing healthier foods.* The commodity composition of these kinds of price and quantity restrictions reflect the economic, social, and political importance of the various crop and grower associations and the small and large industries that rely on them. Whenever the welfare of small subgroups is weighed against the broader interest, the politics of hurting a small but powerful group usually outweigh the smaller negative impacts on a vaster set of individuals (Nestle 2002). When small welfare losses result, over time, in a large cumulative disease burden, the economics of such trade-offs should be revisited.
  - *Evaluate food trade policy from a health perspective.* The General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) use a number of agreements to navigate health issues, including the Sanitary and Phytosanitary (SPS) Agreement and the Trade-Related Intellectual Property Rights (TRIPS) Agreement. Can these agreements be used to regulate the health content of food imports? Past experience suggests that they can—if scientific risk assessments show danger (and if there is research money available to study them). For example, using the SPS, the WTO stated that the overturning of the European Union (EU) import ban on hormone-fed cattle was based on the absence of an empirical risk assessment. Perceptions of health risk were not sufficient to win the case for the EU (Bloche 2002). Beyond obvious health-related trade instruments, can the health community influence the trade community, as have the labor and environmental communities? Do we know whether the commodity-protection profiles of different countries are pro- or anti-health? If we did, would

the health community be able to influence trade policy? If it could (and we must, at present, consider this improbable), are there non-health downsides for poor farmers and consumers from an altered pattern of trade? These issues have not been explored, and this is surely an area for future research as the percentage of food consumed from trade increases.

- *Stricter standards on fat content of food away from home and in schools.* In the United States, the menus in many public schools fail to meet USDA dietary guidelines (Brownell 2002a, 2002b).
- *Reduce malnutrition in utero.* The “Barker Hypothesis” posits that maternal dietary imbalances at critical periods of development in the womb can trigger an adaptive redistribution of fetal resources (including growth retardation). Such adaptations affect fetal structure and metabolism in ways that predispose the individual to later cardiovascular and endocrine diseases (Barker 1998). The correlation between low birth weight or early childhood stunting and later cardiovascular disease and diabetes may arise from the fact that nutritional deprivation in utero or in early childhood “programs” a newborn for a life of scarcity. The problems arise when the child’s system is later confronted by a high-fat, high-sugar diet, in combination with lowered activity. If this hypothesis is borne out (evidence is accumulating both for and against it), it will serve to remind us that one food policy option for attenuating the impacts of the diet transition is to reduce intrauterine growth retardation. For example, based on a balanced review of the evidence as of 2000, Popkin, Horton, and Kim (2001) conclude that in China, approximately one-third of diabetes can be traced to low birthweight and stunting in infancy, with this percentage declining in 2020 on the assumption that low birthweight and stunting will decline. There are a number of interventions to address low birth weight at term, ranging from the immediate (e.g., improving the food intake quantity and quality of adolescent girls and

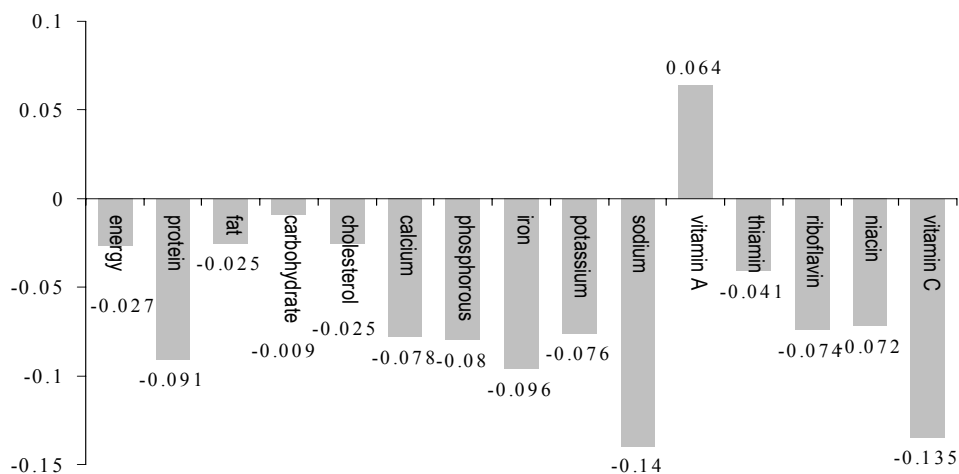


expectant mothers and improving the quality of prenatal care) to the underlying (e.g., improving women's status in terms of resource allocation decisions).

### **Demand-Side Interventions**

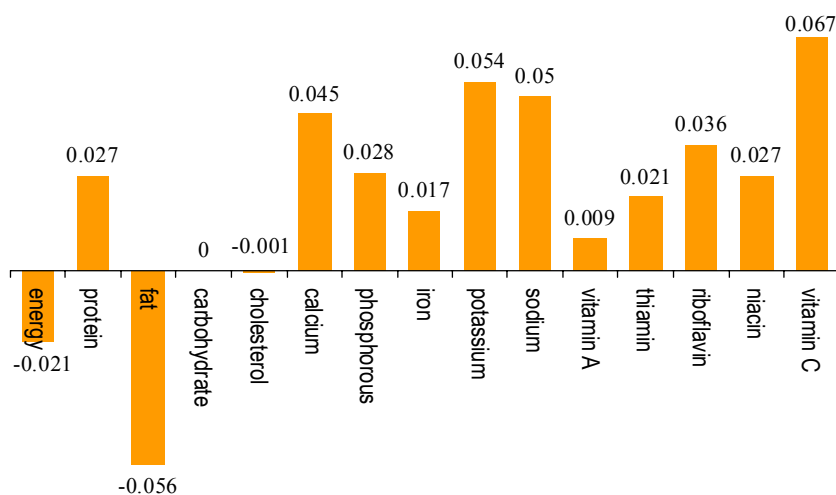
- *Increase the relative price of unhealthy choices.* This is an option that veterans of antismoking campaigns might find appealing. It often underlies discussions of what food policy can do to increase the healthiness of the diet transition—increase the price of offending foods (e.g., Guo et al. 1999). Food price policy in developing countries has a rich analytical underpinning, although principally from the undernutrition perspective (e.g., Alderman 1986). However, it is difficult in practice to identify a food for which an increase in price will not reduce access to healthy components of a diet—components that in a developing country context may be in short supply. Figures 4 and 5 illustrate this for U.S. data on meat and edible oil consumption. Figure 4 shows that an increase in the price of meat has a positive effect on fat and cholesterol intake, but it also has a negative effect on a wide range of crucial dietary components—especially for infants and women (Huang 1996). For the same demand system estimates, Figure 5 shows that an increase in edible oil prices decreases fat consumption and increases consumption of nearly every other dietary component due to substitution of other foods. This is more in line with the kind of results I might hope for. However, in a developing country context, edible oil is often used to increase the energy density of infant diets.
- *Clearer information about product contents.* Food labeling can help reduce information asymmetries, but often it can be confusing, is obviously of limited value in areas where literacy is weak, and may be better at discouraging certain types of behaviors perceived as risky than encouraging healthy behavior (e.g., Verbeke and Ward 2001 on BSE [mad cow disease] in Belgian beef).

**Figure 4—Responsiveness of nutrients (percent) to a 1 percent increase in the price of meat, U.S. price elasticities**



Source: Huang 1996.

**Figure 5—Responsiveness of nutrients (percent) to a 1 percent increase in the price of oil, U.S. price elasticities**



Source: Huang 1996.

- *Better awareness about consequences of poor diet.* A number of initiatives have been employed in developing countries to raise awareness of the causes and consequences of poor diet. These involve a mass media campaign to reduce overweight in Brazil; dietary guidelines implementation for nutritional well-being in China, and school-based training for improving diet and activity levels in Singapore (Doak 2002). Evaluations of the effectiveness and cost-effectiveness of these attempts to change behavior are desperately needed.

### **Policy Trade-Offs Accentuated in a Developing Country Context**

Policy formulation on dietary change in the developing world must build on the evidence base accumulated in the industrialized world. However, the developing country context is very different. Policymakers must remember the following:

- Food consumption deficits are still widespread. Thus, many groups require the *other* nutrients contained in the food being discouraged, e.g., the micronutrients in livestock.
- Certain groups need to consume even foods that are “empty” sources of the dietary component being discouraged, e.g., edible oils and infants.
- The capacity to influence preferences via the public sector is likely to be lower than in the industrialized world. Whether the imbalance between public- and private-sector power to communicate nutrition messages is growing in the developing world is an open question, but with multinationals backing much of the nutrition messaging in the developing world, one would not be surprised to see this occurring (Hawkes 2002).
- On the supply side, anything done to discourage the consumption of a locally produced food considered harmful to health above some cutoff will harm the income-generating ability of smallholder farmers. They may not have the political strength of industrialized country farmers, but the economic impact on the rural economy of an attempt to alter consumption could be large.

- Many developing countries are desperate to increase foreign direct investment. Attempts to discourage foreign supplies of foods that are designated “less healthy” may have employment and livelihood consequences.

### **The Uniqueness of Food**

Finally, it is important to note that food represents a class of commodities that is difficult to influence in a predictable manner. In particular, the temptation to apply the model that was so successful in curbing tobacco consumption (World Bank 1999) to food should be resisted. Comparisons may be more valid in some countries with powerful judicial systems. But even in the industrialized countries there are some important differences—a poor diet is not a smoking habit. First, there is a difficulty in identifying the “offending product.” Second, with tobacco, there are no obvious consumption trade-offs with positive outcomes. Third, there are fewer obvious private externalities (such as “secondary eating”). Finally, there is a broader constituency for food farmers than for tobacco farmers.

Because of these and other differences, the “triggers” for strong public action are not yet in place (Kersh and Morone 2002). Table 3, adapted from Kersh and Morone (2002), lists the “triggers” for public action in health and assesses their strength in the United States as applied to the obesity problem there. The authors conclude that only the first three of seven triggers have been tripped: social disapproval, evidence from medical science, and the evidence of self-help groups. Such constructs help us to remember that evidence is only one ingredient in the formulation and implementation of public health policy.

## **4. Information and Analysis Gaps**

Research in the area of the diet and nutrition transition in developing countries is in its infancy. Most of the work has been spent documenting it and analyzing its causes.

**Table 3—“Triggers” for successful government regulation of private behavior when a “political window” opens**

<b>Trigger</b>	<b>Comments</b>	<b>Power of obesity triggers in the United States</b>
1. Social disapproval	Recognition by society as a “bad thing”	There is a popular disapproval of obesity
2. Medical science	Role is to challenge myths	There is strong evidence linking diet to obesity and obesity to chronic diseases
3. Self-help	e.g., Alcoholics Anonymous	Overeaters Anonymous, Weight Watchers
4. Demonize the user	e.g., fearing the drug culture	Obesity does not play on fears. No evidence of trigger yet.
5. Demonize the provider	e.g., big tobacco	No “big chocolate” yet. “Fast-food nation” gaining consciousness. No evidence of trigger yet.
6. Mass movement	Protests, rallies	No evidence of anti-obesity campaigns (possibly the opposite, re: accepting body image). No trigger yet.
7. Interest group action	Lawyers and lobbyists	Yet to be achieved. No trigger yet.

**Source: Adapted from Kersh and Morone 2002.**

Much of this work has made do with crude food data (national supply, not household-level availability or individual intake). Very little research has focused on policy analysis. The following areas deserve much more attention from the research community.

- There is a need to use *existing* nationally representative household survey data to systematically chart trends in availability of “bad” food components. These data sets are available for a large number of countries, but are solely used to estimate poverty rates.
- The location of consumption and the health content of that consumption need to be better connected, with more data collected on the characteristics of the points of sale, whether they are street food vendors or supermarkets.

- Food price elasticities need to be generated for large developing countries that are disaggregated enough to be policy relevant (e.g., “meat” is not useful, but “high saturated fat beef products” might be).
- The trade-offs in terms of the consumption changes of different dietary components of different population subgroups resulting from the change in the price of a single commodity need to be spelled out, as do the implications for smallholder income generation.
- There need to be more evaluations of nonprice interventions to change diets, both in terms of quality and quantity.
- There has to be more research on the investments and institutional innovations that smallholder farmers need to link up with growing domestic and international markets for healthy foods.
- More research is needed that links trade policy with health outcomes, perhaps via the linkage of computable general equilibrium models (CGEs) and micromodels of individual welfare outcomes (e.g., Cogneau and Robilliard 2000).
- Research on the policy process and the role of information will be useful to help us understand why the public health response to chronic disease has had varied effectiveness.
- More research needs to be done on identifying institutional mechanisms for win-win public-private partnerships (e.g., Buse and Walt 2000) to reduce the amount of unhealthy fat and added sugar entering into the developing country food supply.
- Too much of the evidence cited in this paper has come from just one country—China. A similarly concerted effort needs to be undertaken in other large countries for which there are indications that the diet transition is accelerating—e.g., India, Brazil, Indonesia, South Africa, and Nigeria.

## 5. Conclusions

The diet transition in the developing world seems to be accelerating. It seems to be a transition toward an increased burden of chronic disease. It is increasing human costs in terms of mortality and the disease burdens, and it is increasing economic costs in terms of lower productivity. It is driven by changing preferences fueled by growing incomes, changing relative prices, and urbanization; by changing food choice options fueled by changes in food technology and in food distribution systems; and by a legacy of low birth weights from the previous generation. Is there a case for public investment in efforts to influence the transition toward increasingly healthy outcomes? The existence of information asymmetries and negative externalities suggests that there is.

What can food policy do? We have identified a number of options from the food supply and demand sides. These options have had mixed success in industrialized countries. The policy trade-offs in the developing world are even more complicated. For example, efforts to overcome overnutrition might undermine efforts to overcome undernutrition. The public health antismoking policy model offers some insights, but it should not be leaned on too heavily—food is not tobacco. There are plenty of areas in which additional technical research is needed to assess competing risks and to help develop policy options. But there is also a great need for research to engage actors in the policy process underlying the diet transition. In a debate where so much is at stake—market shares, profits, livelihoods, and life itself—there is a potentially powerful role for researchers to bring different actors to the table. This may help to improve the decisionmaking processes underlying the attempts of food policy to redirect the diet transition toward healthier outcomes.

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