





Reaping what you SOW?



Aleda V. Roth
aroth@clemson.edu
Clemson, USA



Andy A. Tsay
atsay@stanfordalumni.org
Santa Clara, USA



Madeleine E. Pullman
mpullman@pdx.edu
Portland, USA



John V. Gray
gray.402@osu.edu
Columbus, USA

As food supply chains get longer, new and unexpected supply chain challenges such as transparency and traceability are moving to centre stage. To rise to these challenges, managers need to design quality into their processes.



In March 2007, after a five-month investigation, the US Food & Drug Administration (FDA) announced that it had found contaminants in vegetable proteins imported from China and used as ingredients in pet food. Subsequently, hundreds of pet food brands were recalled, triggering an avalanche of reports in the popular press about problems with other Chinese-made products. Of the 152 non-food consumer products recalled by the United States Product Safety Commission between January and early June 2007, 104 were made in China. FDA reports of carcinogens, pesticides, bacteria, drugs and heavy metals in imported foods have exacerbated consumer concerns. On the surface, at least, it appears that US firms importing from China are facing tremendous challenges in managing the quality of imported products. This challenge is particularly momentous due to the growing role of low-cost countries in food sourcing.

Aleda V. Roth is Burlington Industries Distinguished Professor in Supply Chain Management at the Department of Management, College of Business and Behavioral Science, Clemson University, Clemson.

Andy A. Tsay is Associate Professor of Operations & Management Information Systems at the Leavey School of Business, Santa Clara University, Santa Clara, California.

Because myriad problems have surfaced over the past several years, China provides an example of the daunting new issues created by global supply chains, especially for food products that are sourced from developing countries. China is increasingly a provider of ingredients for processed foods, supplements and active ingredients in pharmaceuticals; and the concerns raised about tainted food highlight the vulnerabilities and quality risks in sourcing food from emerging markets. Consumers and retailers generally are unaware of the country of origin of the raw inputs for processed foods and drugs. Moreover, the high degree of fragmentation and resource shortfalls limit the regulatory oversight, which exacerbates the potential risks in the global sourcing of food. In China, for example, because food is collected from millions of small farms and many transactions are often in cash, huge gaps in documentation make it nearly impossible for buyers to trace raw ingredients back to the source.

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This asymmetry in information obstructs the abilities of regulators, buyers, and ultimately, consumers to make good decisions, thereby undermining trust. A recent study by American Express showed that confidence in imported foods is fast eroding. Up to 40 percent of US consumers are now avoiding foods from certain countries.

How should managers tackle these challenges? Consumer advocate groups and, more recently, some food makers have demanded stricter regulations for food safety. Suppliers, manufacturers, distributors, wholesalers and retailers are also piling on inspections, which add tremendously to food costs. But these tactics alone will be neither sustainable nor effective in the long run. Supplying from developing countries introduces geographic, administrative, cultural and economic distance for buyers from industrialized countries, and these distances are not currently well understood in supply chain management.

Clearly a different path must be taken. We need to design quality into supply chain processes. Unlike inspections or regulations, this path requires a deep understanding of the root causes of process failures and the will to implement robust solutions to those problems. Unfortunately, as we will show, the

Madeleine E. Pullman

is Associate Professor at the School of Business Administration, Portland State University, Portland, Oregon.

John V. Gray

is Assistant Professor at the Fisher College of Business, The Ohio State University, Columbus, Ohio.





evolution of the food industry has complicated this task. In this paper, we show how and why this has happened, and suggest a way forward: application of the 6Ts of supply chain quality management (traceability, transparency, testability, time, trust, and training).

are involved in multiple product hand-offs, often over vast geographic distances. As long as the underlying norms of the key parties are similar, these challenges are relatively manageable. In the case of food sourced from emerging markets like China however,

suppliers' norms and infrastructure differ substantially from those of their Western counterparts. This generates new challenges.

Let's examine some characteristics of China and Chinese culture that complicate food supply chain management and exacerbate quality and supply disruption risks not typically captured in traditional procurement decisions. Before we investigate these risks, we qualify the subsequent analysis with the following: (1) these are general assessments, clearly not true of all individuals and compa-

nies in China; and (2) we make no claim that Western nations are immune to issues with quality in food production, as recently confirmed by incidents such as the USDA's February 2008 recall of 143 million pounds of beef originating from a Southern California slaughterhouse.

Despite rapid growth and industrialization, for most people (and businesses) in China life is still harsh. China's cities contain an estimated 30 million unemployed and countless transient workers, with another 900 million people living outside urban centers, often in difficult conditions. While wages are rising in the aggregate, for many the cost of living is rising even faster. Among businesses, cut-throat competition quickly eats away at any available economic opportunities. This situation helps explain a popular sentiment in China: survival is simply impossible without breaking some rules. Meanwhile, the fast pace of change stymies the Chinese government's ability to safeguard the quality of the country's production.

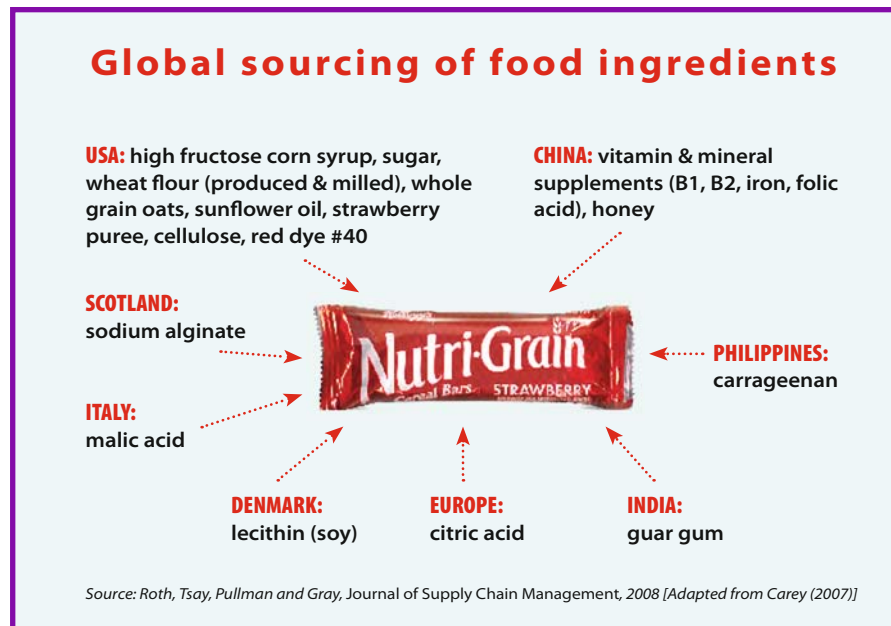


Figure 1: Nowadays, even a 'simple' product such a Nutri-Grain bar sources its ingredients from all over the world

Waiting to go wrong?

Over the last few decades, the market for foods in Western nations has been transformed by three interconnected forces: globalization, consolidation and commoditization. Traditionally, food was grown and processed relatively close to the point of consumption. Today, everyday branded products are produced by huge centralized organizations that source and combine a wide range of ingredients from all over the world (see Figures 1 and 3). The markets for these ingredients have been rapidly commoditized, the key criteria for supply and purchasing managers being high levels of standardization, high volumes and, especially, low prices.

Globalization has brought branded foods companies many benefits, including lower costs and improved operational flexibility. But it also complicates supply chain management. A proliferation of entities – from farmers to processors to intermediaries to wholesalers to retailers to consumers –



When money is so difficult to earn it should not be a surprise that people are very cost conscious and reluctant to pay for product attributes, such as traceability and transparency, that do not have an immediate perceivable value. This thinking is common both among Chinese consumers who continually put pricing pressure on Chinese manufacturers, as well as managers in the companies themselves. Being judgemental about such attitudes and practices is easy, but it is non-productive. Given the degree of economic desperation that sometimes underlies these behaviours, they may be considered rational in any culture where people face similar harsh conditions.

Many Chinese accept that survival is impossible without breaking some rules. Many features of Chinese supply chains – such as keeping suppliers' identity secret – make rule breaking relatively easy. And enforcing regulations is often very difficult.

Other factors increase quality risk in this setting. First, the relentless push by Western companies for lower and lower prices (i.e. the 'Wal-Mart effect') potentially influences errant supplier behaviours. For example, observers have provided accounts of 'quality fade' by Chinese suppliers, a practice where they quote a low price to win a contract and then cut corners on quality once the relationship is safely underway – for example, substituting ingredients or skimping on proper handling. Moreover, many buying organizations work hard to keep secret their Chinese suppliers' identities. This serves to prevent competitors from poaching qualified suppliers. It also prevents end consumers from knowing the ultimate source of the products/ingredients they buy. Furthermore, many outsiders use local intermediaries instead of engaging with Chinese suppliers and

farmers directly. Suppliers see these middlemen as their 'real' customers. It is this middleman whom suppliers work hard to satisfy, not the end-producer or final consumer. In addition, Western companies face difficulties taking legal action in China. For all these reasons opportunistic behaviour often has few short-term consequences for the Chinese supplier.

Second, the average person's acceptable level of food hygiene in a developing nation is lower than that of the typical Westerner. One reason for this is economic. To the hungry, issues like traceability or transparency seem like luxuries. For people just emerging from austerity, the food and food handling methods used locally and that have kept them alive in the past seem quite adequate. Economics aside, many Chinese have beliefs about human health that include a certain aversion to excessive hygiene. For example, one Chinese folk saying explicitly suggests that eating foods that are too hygienic actually weakens one's digestive and immune systems. Some Chinese are convinced that obsession with cleanliness causes Westerners to get sick more often than Chinese people. These personal views on hygiene matter because they influence the workplace behaviours of workers and managers in the food supply chain. This concern was recently raised in the CNBC documentary "Big Mac: Inside the McDonald's Empire," which noted how McDonald's had to make adjustments to their sourcing practices and physical restaurants to ensure food quality safety and sanitation.

Ironically, China's entry into the World Trade Organization in 1999 may have exacerbated these food safety problems by facilitating a co-mingling of standards and practices. Prior to that, some Chinese organizations segmented their domestic and international customer bases by their willingness and ability to pay for food processing integrity, giving each market a distinct supply chain. Maintaining this separation was expensive. WTO entry has allowed Chinese suppliers to simultaneously serve both export and domestic markets, whereas previously suppliers could only serve either one market or the other. It is highly likely that many local food workers are still bringing their own local standards to their daily work routine.

Finally, cultural factors also come into play. Chinese culture tends to be averse to the direct acknowledgment of issues that cause embarrassment. This has implications both for how companies manage



difficulties internally and locally, and how the Chinese government handles problems that have escalated in scale. Unwillingness to acknowledge problems and immediately work on them contradicts modern principles for quality management, such as those of Six Sigma and lean production. Delays in resolving problems only allow them to fester, spread, and further obfuscate root causes.

A logical approach to addressing these issues is the creation of standards and the strict monitoring of compliance to these standards. However, significant hurdles must be overcome. The Codex Alimentarius is the international food code administered by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). It specifies over 2,500 maximum “allowable residue levels” in foods. The European Union goes much further with over 22,000; the United States has over 8,600. By comparison, China has only 484 restrictions and fewer than 20 percent of these conform to Codex levels. Enforcing even these standards is a daunting task – a fact that is misunderstood, or ignored, by complacent Western buyers.

Moreover, while the Chinese government is upping its scrutiny of food safety, the enforcement of standards is largely the responsibility of local Chinese authorities. Because approximately 70 percent of a typical local official's personal annual performance assessment is based on the GDP growth in his or her jurisdiction, such enforcement is not consistent. The reward system sometimes encourages the bolstering of local businesses with access to cheap

credit, land, licenses, protection from competitors – and exemptions from regulations that may affect food safety.

In short, global supply chains – especially food-related ones – present challenges that go far beyond most supply chain managers' experience and expertise. Because these are economic, institutional and cultural issues, technical purchasing skills alone will not suffice. So what can supply chain managers do? The answer lies in a deep understanding of the 6 Ts of supply chain quality management.

Many cultural and institutional factors exacerbate poor understanding between Western buyers and Chinese suppliers. These include attitudes towards food hygiene, avoiding issues which may cause embarrassment, and perverse incentives for local officials charged with enforcing regulations.

Because these are economic, institutional and cultural challenges, technical purchasing skills alone will not suffice. Managers need to broaden their criteria for judging the quality and robustness of their extended supply chains.





The 6 Ts of supply chain quality management

One way of rising to this challenge is to broaden the set of criteria by which supply chain managers judge their own performance and that of their suppliers. The new criteria go beyond the typical focus on cost and functional specifications to emphasize the robustness of the quality, practices and processes along the supply chain itself. We describe these broader criteria in the form of the 6 Ts: traceability, transparency, testability, time, trust and training (see Figure 2).

anytime soon, if only because of the scale of the challenge: bulk food ingredients are sourced from millions of small farms. Nevertheless, traceability down the chain to the food source (e.g. the specific animal and plot of ground) is becoming a supply mandate.

Companies sometimes have economic incentives to create robust traceability systems. These systems can improve supply management, increase safety and quality control, facilitate the selling of a high-margin credence attribute (e.g., organically grown) products, and reduce the likelihood of expensive and

The 6 Ts – Definitions	
Traceability	The ability to track a product's flow or attributes throughout the production process and supply chain to the source.
Transparency	The lack of secrecy regarding, or the systematic provision of, product and process information.
Testability	The ability to detect an attribute of a product.
Time	The duration of specific processes, especially between the discovery of problems, and the recovery from supply disruptions.
Trust	The expectation that parties will make a good-faith effort to behave in accordance with any commitments, be honest in negotiations, and not take advantage of the other party.
Training	The systematic process of improving knowledge, skills, and attitudes regarding international standards of quality, food safety, and best practices.

Figure 2: The 6 Ts of global supply chain quality defined

Traceability

Traceability was one of the first issues raised once the pet food recalls were underway. US consumers were dismayed at how long it took to trace the contaminated ingredients to the country of origin and then identify their source within China. Complicating matters was that FDA officials were not allowed to enter the suspected plants for weeks while their entry visas were held up. Moreover, recent initiatives of the FDA and the Chinese regulatory agencies regarding traceability are unlikely to have an impact

embarrassing recalls. Yet even the definition of what constitutes 'organic' varies widely around the globe. Chinese farmers may have an interpretation of organic that differs from that of their Western counterparts. Tracing the entire path of ingredients and products from fields to factories to grocery store shelves is a tremendous technical undertaking even within a single country. Through a complex maze of middlemen globally, it is even more daunting. Thus, the privately optimal level of traceability often falls short of the socially desirable levels in emerging market economies.

Governments sometimes deal with this market failure by imposing traceability requirements. As a proactive strategy to either promote credence attributes or avoid increased government intervention, industry groups may develop systems for third-party verification of safety, quality and credence claims. However, the efficacy of these systems in complex supply chains is not well established. There is even a growing cottage industry of consultants that offer to assist Chinese companies in evading compliance audits. For there to be any hope, buyers must demonstrate willingness to reward suppliers who have made the investment in robust upstream traceability.

Transparency

Food supply chain transparency is typically very low in emerging markets such as China. China's supply base for food ingredients is highly fragmented, consisting of some 300 million farmers, many working on farms of two acres or less and earning less than \$200 per year. Many of the transactions with these farmers are cash-based, leaving few paper trails. The lack of information technology and captured knowledge causes the trail to get murkier with each hand-off along the supply chain. This opens the door for deception and other opportunistic behaviours.

In addition, maintaining physical transparency of documents, information, and goods across an ocean and multiple ports of entry is a significant challenge – especially given that unscrupulous practices can occur anywhere along the chain such as faking records, changing ingredients, smuggling, double record-keeping and the coaching of workers to give untruthful responses during inspections. Obtaining visibility into food production practices at the source

is even more difficult. For example, determining the amount and type of contaminants in fruits, vegetables, fish and meats requires a detailed knowledge of the production conditions (e.g., type of fertilizers and pesticides, animal feeds and drugs, toxins in the soil, water quality, seeds, etc.) at the point of origin, which is often impossible to establish after the fact. As an example, farmed fish in China may have excessive antibiotics that are not approved in the US, but are necessary because of pathogens in their water.



Figure 3: Should brand manufacturers inform consumers about the origins and provenance of product ingredients?

Today, many companies are not transparent and offer very little information about 'negative attributes'. Eventually, however – and sometimes on the turn of a dime – they will face competitors that make explicit claims about positive aspects of their own products, such as 'made with locally sourced ingredients'. Organizations failing to rise to the transparency challenge risk incurring a 'China penalty' if consumers assume that proper practices are not being followed there. Either way, organizations face a thorny question: how (and whether) to provide 'safe' food products to consumers who are not affluent, educated, or concerned enough to care about these issues to



help foot the bill? As with traceability, transparency of prospective suppliers, as well as their supply base, should be a key factor in food supplier selection (see [Figure 3](#)).

Testability

Hard goods such as electronics often have reliable test procedures that can be applied to 100 percent of the product. In contrast, food inspections are generally “destructive” (meaning that the tested samples are no longer fit for consumption); and testing for the myriad things that can go wrong with food is impractical. For example, a contaminant not affecting the characteristics subject to explicit testing can easily pass unnoticed along the entire supply chain. In addition, minor deviations from even the best processes can lead to problems with stability, shelf life, etc. that simply cannot be detected during normal testing at the production source. Even if the food passes inspection at the factory, problems can arise in transit, such as contamination or spoilage and due to improper refrigeration. These might be discovered only when a critical mass of consumers experience problems.

Food testing is not enough to guarantee food quality. However good testing and traceability regimes are, the longer and more complex the supply chain, the greater the risks are for buyers. Time lags simply increase these risks.

The poor testability of food opens up another can of worms: the deliberate exploitation of shortcomings in known testing regimens by unscrupulous suppliers who know how to cheat the system. In cases where trust, transparency, and traceability cannot be adequately developed, more extensive third-party testing should be considered. But, the key point is that food quality can never be guaranteed through testing alone, especially when only minute

proportions of the supply are tested, leaving the door open for suppliers to circumvent normal regimens. One fact remains: *the longer and more complex the food supply chain, the greater the risks are to buyers*. Even if batches can be subjected to multiple tests along the way, 100 percent testing is not possible. These issues make attention to the other five Ts even more critical for food products than for many other goods.

Time

Time is crucial to supply chain quality management in three areas: 1) time in transit, 2) time between the discovery and reporting of problems, and 3) time for recovery from supply disruptions. Each of these aspects of time is now discussed.

First, food freshness and quality are particularly sensitive to the transit time. Longer periods spent in transit and in ports waiting for entry are common in global supply chains. These delays often necessitate the addition of chemicals to food stocks (e.g., preservatives and dyes), which are often invisible to consumers, sometimes turn out to be unsafe in the short term, or may have long term health consequences. Second, the inherent complexity of global supply chains increases the slowness in reporting and auditing for compliance, which often extends the time between the discovery and reporting of problems.

In the pet food crisis, identifying the ingredient melamine as the culprit took weeks; and it took months to confirm the source and assess the volume of the tainted product in the marketplace. This was due to poor traceability, delays among inter-country agencies and the silence of Chinese wheat gluten producers regarding their unauthorized use of melamine. While not immune to food safety problems, industrialized countries typically disseminate recall instructions more quickly. Finally, although robust supply chains may recover from disruptions relatively rapidly, this is typically not the case when food stocks and ingredients for many different brands originate from just a handful of large contract manufacturers. Unravelling these time-sensitivity issues represents a challenging area for quality risk assessment and supply process improvement. These dimensions of time not only add direct costs to supply chain management, but also many indirect and ‘hidden’ quality and supply risk costs that must be considered when evaluating suppliers.



Trust

Trust is crucial at every level, including that which consumers place in brands and the practices that lie behind the brands, and that which producers place in the quality of suppliers' processes.

One typical way of developing consumer trust is via certification programs. The food industry currently features dozens of product certifications intended to build consumer trust, including sustainable, organic and other practice-based campaigns (e.g., dolphin-safe, humane animal treatment, fair trade, etc.). These programs emerged in parallel with the growth in consumer demand for quality, diversity and availability of locally produced products. Like their counterparts in other internationally traded product industries – such as forestry, fisheries, consumer electronics and household appliances – food certification programs provide an alternative to purely market or regulatory mechanisms in the global marketplace. However, buyers should not view certification as a panacea. Success depends on many factors, including the implementation of the certification's practices within the country, the reliability of the certifying bodies and auditors, and perceptions of corruption in the industry.

Buyer-supplier trust is also necessary in global supply chains. This trust is developed over time, through repeated interactions where each party believes that the other is invested in the mutually beneficial relationship. This trust may be difficult to achieve if buyers simply chase lower prices by frequently putting contracts out for rebidding. Pulling out all the stops to attain the lowest cost oftentimes will result in

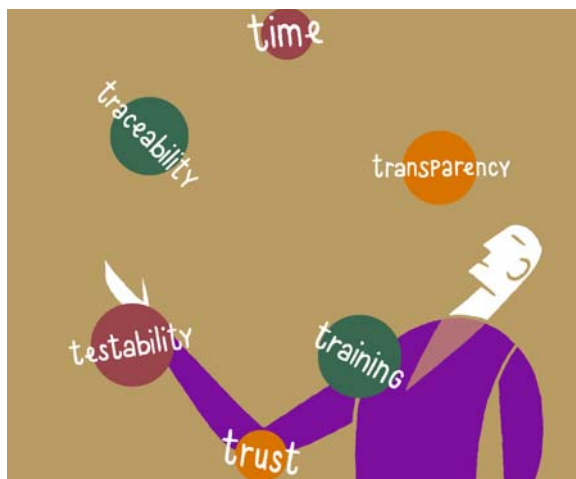
Trust may be difficult to achieve if buyers simply chase lower prices by frequently putting contracts out for rebidding. It often encourages suppliers to indulge in opportunistic behaviours.

unintended consequences – opportunistic behaviours by suppliers that will undermine quality. Companies with valuable brands should be especially cognizant of the trustworthiness of potential suppliers, and how their own behaviours facilitate or hinder the development of open, trusting relationships. Given low testability, supply base trustworthiness is necessary if food quality is to be consistently high.

Training

As supply chains become increasingly global, they pass through ever-broader ranges of educational levels and culturally determined behaviours. Training, including technical assistance and the transfer of best practices, is urgently necessary to bridge the gap between local norms of the supplier's country and international expectations. Here again, the pet food recalls highlight the challenge. Some of the tainting of food was deliberate; the melamine was added to boost apparent protein levels in the pet food. But some of it was unintended. Melamine is also widely used in China as a fertilizer so, for example, it often finds its way into livestock feed for pigs. To further complicate the situation, many Chinese sincerely believe that melamine poses minimal health risk to the hogs or to the people who eat them.

Training must not be limited to the suppliers; purchasing managers need it as well. Buying organizations need detailed knowledge regarding production, supply chain management, and the idiosyncrasies of suppliers' culture and norms. This knowledge is critical to the avoidance of opportunism by suppliers and to the design of transparent, traceable and testable supply chains. This know-how needs to be reinforced by internal training and shared within and across countries through formal and informal means.





Implications for Global Food Supply Chains

We believe that food purchasing managers should incorporate the 6 Ts into their sourcing decisions. Ingredient suppliers, brokers and distributors should all be held accountable for food safety – and all should be evaluated not only on cost, but also on traceability, transparency, testability, time, trust, and training. Another use of the 6 Ts is that they can be incorporated into existing management and improvement processes such as Six Sigma (see [Figure 4](#)).

owners to be seen as ‘squeaky clean’. This is a powerful incentive for improvement. Meanwhile, there is growing acceptance within the industry of the necessity of further regulation and/or certification schemes. However, pressures and tensions on the supply side also need to be addressed.

We started out by stressing the need to identify the root causes of the problem. Our analysis of the pressures and incentives faced by Chinese food suppliers uncovers the many issues that must be addressed

The 6 Ts and Six Sigma

For an organization trying to improve the quality of the products it sources through a global supply chain, the 6 Ts serve as both necessary inputs and desired outputs in each phase of the Define, Measure, Analyze, Improve, Control (DMAIC) cycle of the Six Sigma process.

Define The project team is formed, project deliverables are defined and the team trained. *Traceability* – being able to ‘map’ the supply chain – is an input to this phase. *Training* is an outcome. Supply chain managers need to be trained on the practices required to ensure high-quality product and suppliers need to be trained on those same expectations and standards.

Measure The team identifies the key metrics relating to quality, implements plans to collect them, and obtains a baseline. In this phase, *testability* must be an outcome, as tests must be implemented to allow measurement at each necessary point in the supply chain.

Analyze The team gathers data and determines root causes of any gaps in performance. *Transparency* of procedures and norms is necessary to begin this process. Root cause analysis can also help improve buyer-supplier trust throughout the supply chain.

Improve Covers all key metrics. For the 6Ts it should include *traceability* of inputs, *testability* of products, *transparency* and *time*. Reducing time in the supply chain reduces the risk of many types of quality failures such as those related to perishability and adds to the bottom line.

Control Any improvements made in *time*, *testability*, *transparency* and/or *traceability* need to be shared through system-wide *training*. In this phase, continuous process improvement and discussion help to increase the levels of *trust* throughout the global supply chain.

Figure 4: How the 6 Ts connect with Six Sigma process improvement

As we’ve seen, the various types of distance – cultural, administrative, geographic and economic – that arise from the globalization of food supply chains – make management of the 6 Ts especially difficult when compared to the traditional more localized food supply chain. There is not likely to be a single ‘magic bullet’ to deal with this difficulty. Until recently, consumer awareness and understanding of global supply chain practices and risks lagged far behind the reality. Now however, consumers are increasingly peering behind the ‘brand façade’ to inspect these practices, creating intense pressure on brand

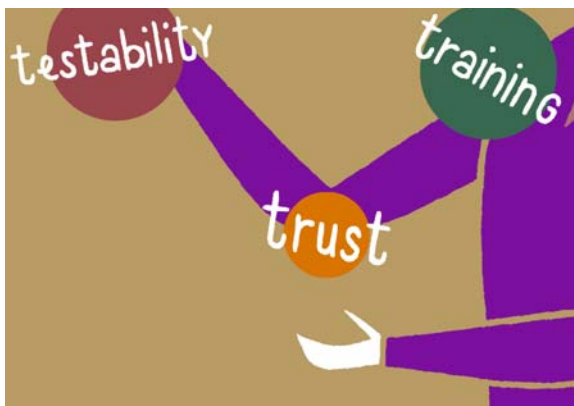
strategically. The strategies adopted by many global buyers thus far – sourcing decisions driven primarily by cost – tend to intensify pressure on suppliers to cut corners on quality while impeding mutual management of the 6 Ts.

Western buyers are not responsible for the current state of the Chinese commercial environment, but they are somewhat responsible for the safety of the products they sell. Thus, they must be part of the solution for finding the best way forward. Western buyers’ blind adherence to the sourcing strategy of con-



tinually demanding lower prices has rapidly moved food sourcing to low-cost countries. In doing so, many followed short-term financial models, which neglected known operations and supply chain principles on quality management. In the context of today's realities in China, a sourcing policy that focuses too heavily on low cost, without regards to prevention and the environment, actually may increase long-term total costs by reinforcing and intensifying the pressures that encourage suppliers to indulge in behaviours buyers neither anticipate nor desire.

In contrast, take Japan where food import policies and testing are far more stringent than those of the US. Chinese companies that export spinach must be not only licensed by Japan, they must also grow their own products on their own plots. The Japanese health ministry maintains a direct influence on Chinese suppliers and the number of intermediaries is greatly reduced. In turn, the Chinese producers can charge higher prices. Thus, while Japan places an overemphasis on regulation and/or inspections that may be more costly in the short run, they have the opportunity to address the root causes of the supply chain quality management difficulties, and unscrupulous suppliers are weeded out.



In short, quality needs to be built into the process. This means sharing best practices, especially those relating to the 6 Ts, with suppliers. It is, however, very difficult to share best practices with a supply base with high turnover, fragmentation, and anonymity. Supply chains that shine with respect to the 6 Ts may only be sustainable if they are built upon a bedrock of longer-term relationships and trusted 'quality' suppliers, who have a strong incentive to improve continuously the quality of their processes.

Sourcing policies that focus too heavily on low cost may actually increase long-term total costs by intensifying pressures that encourage suppliers to indulge in behaviours buyers neither anticipate nor desire.

The gauntlet has been thrown to the food industry due to the many challenges raised by recent food contamination incidents and other scares. Corporate brands and consumer confidence are at stake. Significant changes in buyers' purchasing policies and practices regarding prevention and compliance may be required to restore consumer confidence in globally sourced food, including the option of country of origin labelling for ingredient sources. Some firms may take advantage of the current concerns and choose to source locally for a marketing benefit. For those who continue to source globally, the key necessary change in sourcing strategy is to elevate the importance of the 6 Ts in supplier selection, and (by default) place less weight on short-term costs. For food, this new approach to global sourcing should help prop up ethical, high quality global suppliers, and may in some cases lead to a return to local and regional sourcing.

Further Reading:

- This article is based on "Unravelling the Food Supply Chain: Strategic Insights from China and the 2007 Recalls," by Aleda V. Roth, Andy A. Tsay, Madeleine E. Pullman and John V. Gray, which appeared in *The Journal of Supply Chain Management*, Volume 44, Number 1, 2008
- Cooling, L. "New Safeguards in Food Safety," *Inside Supply Management*, February 2008, pp. 22-25
- Ghemawat, P. "Distance Still Matters: The Hard Reality of Global Expansion," *Harvard Business Review*, (79:8), 2001, pp. 137-147
- Hamprecht, J., D. Corsten, M. Noll, and E. Meier. "Controlling the Sustainability of Food Supply Chains," *Supply Chain Management*, (10:1), 2005, pp. 7-10
- Jiang, W. "Prosperity Based on Poverty and Disparity," *China Review Magazine*, Issue 28, Spring, 2004
- Lort-Phillips, L. "Ethical Trade in China: One Country, Two Systems?" *China Review Magazine*, Issue 27, Winter, 2004
- Midler, P. "'Quality Fade': China's Great Business Challenge," *Knowledge@Wharton*, July 25, 2007
- Zhao, X., B. Flynn and A. V. Roth, "Decision Sciences Research in China: A Critical Review and Research Agenda – Foundations and Overview," *Decision Sciences*, 37(4), 2006, pp. 451-496