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A review of Chinese fish trade involving the development and limitations of food safety strategy☆

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ABSTRACT

The export growth of Chinese fisheries is reviving significantly after a chain of food safety incidents in 2007, but regulatory aspects associated with the scale and rapidity of this revival are far from optimal. Quality and safety problems of Chinese fishery products have remained as a primary impediment to consolidating the country's trade competitiveness in major foreign markets. Continual recurrence of safety scandals due to enterprises' wrongful production and processing practices has frustrated the importers' confidence in Chinese food safety control efficacy. This article attempts to offer some insights into the principal development dilemmas inherent in China's fisheries economic plan to explain the root of government regulatory failures. It further analyzes the opportunities and channels for Chinese government to graduate from a responsive approach tailored to foreign demands, and to take a more cooperative instance when dealing with ever-increasing international food safety standards related to fisheries.

1. Introduction

The Chinese fishery has stood as the world's top producer and exporter for many years, accounting for more than 30% of global yield with a net trade surplus of over US$ 10 billion in 2013 (Fisheries Bureau, 2014a). Home-based aquaculture alone contributes a major proportion and China continues to be the only state with a higher output in farm-raised than capture fisheries in the world (NBSO, 2010). In consequence, enhancing the availability of new fishing grounds, fine species, non-chemical fish feed, and advanced fishing technologies to aquaculture is placed on the 12th Five-Year (2011–2015) National Fisheries Development Plan to capture rapid growth in overseas as well as local food demands for fish (Fisheries Bureau, 2011). It is estimated in the OECD/FAO (2011) report that in 2015, for the first time in history, fish for human consumption originating from aquaculture will probably surpass those from capture fisheries. Chinese aquaculture is projected to represent 61% of that production in 2020. At the same time, the Chinese government's emphasis on developing distant water fishing and deep-sea exploration, which feed back in satisfying foreign and domestic food demands, is becoming apparent in the recent decade (Pauly et al., 2014). It is undisputed truth that the country has acquired the role being a key producer, processer and re-exporter of most frozen fish commodities in the global supply chain (Lindkvist et al., 2008).

Rapid trade development renders it imperative to bring Chinese local standards and regulations more closely to the international regime underpinned by universally recognized food safety concepts and systems. Continued expansion of Chinese fishery footprints, if not disciplined by best regulatory practices, could imply significant human health consequences for domestic and overseas consumers alike. Ironically, China's identity as the world's leading aquatic producer has been struggling for a long time with its suspicious food safety control system since transition to a market economy mixed with socialist Chinese characteristics in the 1970s (Liu et al., 2012). The system is, overall speaking, less rigorous and effective than most developed countries and is particularly so in regards to fish destined for local consumption, that is, having functioned in a two-track fashion for domestic and export market products (Broughton and Walker, 2010). Even for exported fisheries, the volume China exported in 2013 accounts for less than 7% of national output and merely 2% in terms of whole value (Fisheries Bureau, 2014a), thus indicating a large space for quality and safety improvement. The year 2007 came as the peak time when there arose a chain reaction from historically important trade partners to reject all farmed catfish (*Siluriformes* Cuvier, 1817), basa fish

☆ All websites referenced hereinafter were last accessed on July 15, 2015.

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(*Pangasius bocourti* Sauvage, 1880), shrimps (*Decapoda* Latreille, 1802), dace (*Leuciscus* Linnaeus, 1758)), eels (*Anguilliformes* Berg, 1940) and other fishery products produced or processed in China. Alleged was the presence of a wide range of illegal antibiotic residues including antimicrobials nitrofuran, malachite green, gentian violet, flouroquinolones as well as melamine identified in aquatic feed products (Broughton and Walker, 2010; Liu et al., 2012). Such antibiotic residues may contribute to an increase of antimicrobial resistance in human pathogens, and moreover, a carcinogenic affect in the case of prolonged exposure.[1] The crisis involved more than thirty Chinese fishing and processing enterprises which were soon blacklisted by foreign countries, leading to an appreciably slow growth rate of aquatic exports in that year (Liu et al., 2012). In fact, the origin of food safety incidents is not simply attributable to the weak abilities of Chinese producers and inspectors to comply with importers' technical standards. It is part of the larger issue of lacking an effective regulatory and market combined food safety regime across the national economy. Among others, the widespread use of carcinogenic chemicals, notably, nitrofuran metabolites and malachite green, and the overuse of antibiotics and food additives are condemned as the most wrongful practices (Yang et al., 2013). In a rather responsive manner, authorities in China since then have been motivated into a burst of regulatory and legislative activity aimed at strengthening the reputation of Chinese aquatic products in the global market (Liu et al., 2012).

Food safety scandals impeding the export of Chinese agricultural products have long been a primary research subject to unveil the weakness and fundamental defects in Chinese food policy (e.g., Dong and Jensen, 2007; Chen et al., 2008; Ni and Zeng, 2009; Mol, 2014). Investigations focusing on aquatic food quality have risen in volume and depth since the twenty-first century, as a result of the increasing role of fisheries in consolidating China's food security system and international trade image (e.g. Dey et al., 2005; Lindkvist et al., 2008; Li et al., 2009; Wang et al., 2009; Broughton and Walker, 2010; Liu et al., 2012; Goldstein, 2013; Fabinyi and Liu, 2014; Sun et al., 2014; Zhang et al., 2014). Most of these are either restricted to examining policy changes around the benchmark year 2007, or lack comprehensiveness in individual studies i.e. limited to particular aspects of interest, being certification, traceability, processing or fisheries enforcement, etc. A major gap to be bridged is the evolvement of Chinese food security surveillance and its key repercussions on the trade competitiveness of fishery sectors. Hence, this article intends to build and improve upon existing scholarship which has examined Chinese food safety policies implemented in the fishery, or broadly the aquatic industry in the past years. The overall purpose is to explore the recent developments and future transition of Chinese food safety strategy applied to fisheries, especially in the wake of the 2007 export product safety incidents. By doing so, the study not only updates the current knowledge of Chinese food safety system, but more critically, bears out its inherent limitations and suggests on concrete ways of improvement. The specific issues to be explored include: how the Chinese food safety regime has been operationalized at the level of fish trade; whether it has kept pace with the global movement in food safety control involving ever-increasing standards and diversified regulatory means; and what specific policy loopholes have remained, hindering the efforts of Chinese fisheries to restore and secure new growth in foreign market destinations. The analysis begins with an updated account of fishery safety incidents that have tested the ability of Chinese government to respond and to embark on fundamental regulatory reforms. The most obstinate safety issues that have persisted as a severe obstacle for the modernization and escalation of Chinese fisheries are summarized. The next section re-assesses the efficacy of various regulatory responses in order to maintain China's competitiveness in four predominant fishery markets i.e. the United States (US), the European Union (EU), Japan and South Korea, which have been protected under the most rigorous food safety systems in the world. Country-specific estimates of the possibilities and channels for China to label itself as a source of healthy and quality fishery products in these markets are included. The discussion which follows examines further a sequence of transformation problems inherent in Chinese fishery policy. A proper understanding and settlement of these issues is essential to ensuring international re-acceptance of Chinese fishery products in the longer term. The last section comes to the overall conclusion, that is, it is highly advisable for Chinese authorities to graduate from their responsive approach tailored to foreign demands, and to take a more cooperative instance when dealing with ever-increasing international food safety standards imposed on fisheries and related trade.

2. Materials and methods

The study draws predominantly on primary materials to ensure objectiveness and comprehensiveness in discussion. It exhibits legislative initiatives, enforcement mechanisms and planned reforms based on government bulletins, official websites and government-entrusted publications, notably, the Chinese Fisheries Yearbook (2004–2014) and Fisheries Statistical Yearbook (2004–2014) series. Source is thus relied upon communications from pertinent fishery, agricultural and trade agencies including China's Fisheries Bureau under the Ministry of Agriculture, the US Food and Drug Administration (FDA), the EU Rapid Alert System for Food and Feed (RASFF), and relevant international bodies such as the Food and Agriculture Organization (FAO), the World Organization for Animal Health (OIE) and the Codex Alimentarius Commission (CAC). In light of the trade policy analysis involved, the study is further supported by up-to-date information from the Chinese notification system of foreign technical barriers and import risk alerts, which are promulgated regularly by the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) after China's accession to the World Trade Organization (WTO). From an international compliance perspective, public health measures which have mounted to high-profiled trade disputes under the WTO are to be mentioned where appropriate. Besides all, secondary information is solicited from peer-reviewed journal articles as well as domestic and foreign media websites providing news updates on unsettled aquatic food safety matters and any policy changes tailored to stabilize the export market.

When primary data are collected from government sources, they are analyzed by type of trading nations (e.g. traditional developed country markets vs. newly rising ones for Chinese aquatic exports; China vs. other aquatic exporting countries), import violations (e.g. FDA import alert vs. import refusal), absolute (e.g. number or amount) or relative terms (percentage), and products China yearly exports (fisheries, other food and non-food products), in order to see if there is correlation between statistical accounts and China's efforts in rebuilding its national image as a responsible aquatic producer and exporter. When there are important data missing or unreported to the public, they are inferred from currently available information. For instance, the website of Chinese Ministry of Agriculture does not provide for exact export values of Chinese aquatic products to small markets such as Hong Kong before 2007. Hence these figures have to be

[1] FDA, 'Import Alert 16–131: Detention Without Physical Examination of Aquacultured Catfish, Basa, Shrimp, Dace, and Eel from China- Presence of New Animal Drugs and/or Unsafe Food Additives', available at http://www.accessdata.fda.gov/cms_ia/importalert_33.html.