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Salmonella at Early Stage of the Feed Chain

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Abstract. Co-products from oil production in the crushing of soybeans, rapeseed and sunflower such as meals or cakes are important protein sources in animal feed worldwide. Soybean meal is the major protein source in many pig feeds. Accumulated prevalence data from many countries show a higher contamination with *Salmonella* in feed raw materials from processed oilseeds, such as rape seed, soybean and corn compared to other plant raw materials. The reasons why the data for processed oilseeds show a higher prevalence for *Salmonella* is presently unknown as temperatures and process conditions used in the oil extraction process would efficiently destroy bacterial cells. Feed materials are usually traded as bulk materials and there is also a risk that contamination by *Salmonella* may occur during storage and transport. Recently, the European Food Safety Authority (EFSA) conducted a quantitative microbiological risk assessment of *Salmonella* in slaughter and breeder pigs. It was stated that control of animal feed was an essential element in an integrated control strategy for *Salmonella*, an association which were documented in several studies. Other authors have also concluded that feed raw materials have been shown to be important vectors for *Salmonella* dissemination in the feed chain causing animal infections. There is presently a lack of knowledge why soybeans and soybean meal seem to be contaminated with *Salmonella* and tracing the source of the infection in the feed chain is essential in building cost-effective control measures for the food chain. The aim of the present work was to investigate if *Salmonella* could be detected at an early stage of the feed chain, in this case in the processing environment of crushing plants for soybeans and also in newly processed soybean meal. In addition we were interested to find out if soybean meal further down the feed chain, in a warehouse used for export of soybean meal, possibly were contaminated with *Salmonella*. The presence of *Salmonella* was followed in environmental samples of soybean meal from different processing plants and in an export harbor for two months. A total of 598 samples were investigated and 14.4% of samples from crushing plants and 15.6% of samples from the harbor were positive for *Salmonella*. *Salmonella* was more often isolated from the loading area of the plants compared to the warehouse. A total of 18 different *Salmonella* serotypes were identified notably some of the serotypes were present in the processing plants as well as the export harbor. This is the first study showing the risk for contamination with *Salmonella* in soybean meal at an early stage of the feed chain. Future work will be directed to finding the source of contamination and thus to improve the hygienic conditions of the feed ingredient.