high ethanol yield per fermentable mash, considerable savings in energy and process water usage, and effluents with low biological O_2 demand amongst others. Limitations to full commercialization of the technology have been attributed to deleterious effects of the fermentation condition on yeast physiology which include high osmotic stress and ethanol toxicity amongst others. The impact of these physiological stress during high substrate fermentation manifest as sluggish and incomplete fermentation with high residual sugars in beer, reduced ethanol yield, disproportionate synthesis of esters and generation of respiratory deficient yeast crop. However, several studies has implicated Mg ions with numerous biological processes and more importantly, with the role of curtailing the impacts of these stress conditions. This review highlights two potential stress conditions of VGH fermentation; their mechanism of inhibition versus yeast stress response mechanism, role of Mg ions in yeast physiology and its impact on fermentation processes. The knowledge emphasized herein will be of practical importance to industrial fermentation processes, as it provides possible clue to enhancing yeast fermentative performance under high substrate conditions - with perspectives to precise Mg regulation in yeast.

P018

Testing of a new South African built laboratory-scale degerminator for the production of maize flaking (hominy) grits for cultivar evaluation

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Effective evaluation of the potential performance of new maize cultivars for the yield of large flaking grits is complicated by the lack of suitably designed laboratory equipment. Cultivar breeders often can only spare a small sample (2 to 3 kg) for the crop quality surveys done by the Southern African Grain Laboratory. Milling Index on cultivars is currently measured using a laboratory-scale roller milling system but still lacks the crucial degerminator step. Lack of suitably-scaled laboratory degerminator units internationally have led to the design of a new prototype model for the SAGL. The unit was tested successfully using 500g size samples of a range of South African and Italian hominy grit-type maize cultivars. Maize was conditioned overnight to 13% moisture, followed by conditioning to 18% for up to 30 minutes depending on moisture uptake rate. Degermination efficiency was tested against a selection of degerminator outlet gap sizes and back-pressure retention times in order to produce a mixture of maize grits, bran, germ and fines. Samples were sieved using 6.35mm, 4mm, 3.35mm, 2mm and 850micron sieves. Fractions were aspirated using a modified SAGL semolina aspirator fitted with an increased power extraction fan. Grit yield was determined as mass fraction percentages. Maize grits of acceptable size and yield were successfully produced. The Pearson correlation coefficients for the flaking grit fraction above 4mm on the laboratory-scale degerminator were 0.90 and 0.91 respectively when compared to total and large flaking grit yields in a commercial mill in Turin, Italy, where a series of candidate cultivars was milled on industrial scale. Sub-samples of the same cultivars were imported to South Africa and analysed at the SAGL for the generation of the required calibration data. This collaborative project between SAGL and the University of Turin is ongoing and trials testing South African cultivars are in progress.

P019

Identification of the microbial diversity and characterisation of *Bacillus* species for the enhanced fermentation of bambara groundnut in the production of African condiments

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African condiments are products from alkaline fermentation of several legumes native to West Africa and they serve as a low-cost meat substitute. Typically, the fermentation is spontaneous without a start culture and no standard process control. This affects the product quality consistency and flavour compounds composition. In recent times, the demands for these condiments have increased due to the shift from western flavouring products to the locally produced products by the middle-class population in Africa. Production from bambara groundnut is limited, however, this legume crop have the highest potential as substrate because it is drought resistant and high in carbohydrate. The *Bacillus* species solely responsible for the fermentation has not been well characterised, with most of the identification method being phenotypic and biochemical test. The flavour compound composition for bambara groundnut fermentation is yet to be documented. This study endeavours to identify the microbial diversity using both phenotypic and genotypic methods. The several *Bacillus* species were characterized using 16S rDNA PCR. Studies were carried out with bambara groundnut for both spontaneous fermentation and fermentation with *Bacillus* isolates as a starter culture. These were studied for their fermentation parameter, optimal flavour compound production time and composition of flavour compounds.

Food Quality and Shelf-Life

P020

Diversity of staphylococcal species in pork and beef Kitoza

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Kitoza is a traditional product from Madagascar manufactured either with strips of pork or beef meat. It is an artisanal product manufactured in rural and urban regions. The first step of the process is salting with coarse salt mixed with spices and then either a drying or smoking step is carried out. Samples from pork and beef and both processes have been analysed. The microbiological analyses revealed the process allowed the selection of microorganisms with potential technological interest. Thus a high level of coagulase negative staphylococci (CNS) was noticed: between 5 to7 log CFU/g. These technological bacteria seemed well adapted to the two processes drying or smoking. 811 isolates of presumed CNS from Manitol Salt agar have been identified. Two approaches have been applied: a PCR multiplex as developed by Corbière Morot-Bizot et al. (2004. J. Appl. Microbiol. 97, 1087-1094) or a staph array developed by Giammarinaro et al. (2005. J. Clin. Microbiol., 3673-3680) allowing the identification of 36 CNS species. A total of 9 species of CNS were identified in the Kitoza with 7 species for the beef and 8 for the pork meats. *Staphylococcus saprophyticus* was the dominant species in all the products and the major one in dried pork and beef smoked or dried. While in smoked pork, in addition of *S. saprophyticus* (50%), *S. xylosus* (13%), *S. equorum* (15%), *S. succinus* (13%) and *S. epidermidis* (9%) were identified. This study highlighted that the process: salting and drying or smoking allowed the selection of coagulase negative staphylococci. These CNS are well described in the literature as contributing to the quality of meat products, with some species such as *S. xylosus* already used as starter cultures for the manufacture of meat products. This work was funded by EU, 7th Framework Programme, AFTER project (grant agreement 245025).

P021

Staphylococcal population in Lanhouin: potential indigenous starter?

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Lanhouin is a traditional fermented fish based condiment mainly processed in the coastal areas of Benin. Its production is still artisanal, and two mainly conditions, aerobic fermentation and semi aerobic