

**SUMMARY OF THE UNIVERSITY OF SYDNEY POULTRY RESEARCH
FOUNDATIONS SORGHUM TECHNICAL NOTES (2014 – 2017)
COMMISSIONED BY THE FEED GRAIN PARTNERSHIP.**

1. [Sorghum: An enigmatic grain](#). Author: Ha Troung

- Discusses the factors influencing the performance of broiler chickens offered sorghum based diets - pellet quality, protein quality of sorghum, energy derived from sorghum starch, sorghum grain texture and particle size, steam pelleting temperatures and feed additives in sorghum-based diets.
- A number of issues identified in this introductory Technote are considered in more detail in the subsequent Technotes.

2. [Red versus white sorghums Part 1](#).

Authors: Sonia Yun Liu, Ha Truong and Peter Selle.

- The perception amongst pig and poultry nutritionists is that white sorghum is the better feedstuff in comparison to red sorghum. This Technote discusses the validity of this perception and identifies underlying factors contributing to the superiority of white sorghum.

3. [Phytate in sorghum: why are responses to phytase as modest as they appear?](#)

Authors: Sonia Yun Liu, Ha Truong and Peter Selle.

- In Australia sorghum grain is known to contain more phytate than other major feed grains.
- This Technote discusses the presence of phytate in pig and poultry diets and the positive and negative effects of using the phytate-degrading feed enzyme phytase.
- The results of several trials indicate that the impact of phytase supplementation of sorghum based diets appears to be muted. The Technote provides details on some potential reasons for the muted results from the use phytase on sorghum.

4. [Digestive Dynamics of Starch and Protein Part A – why is it important in sorghum-based broiler diets](#).

- Conventionally apparent digestibility coefficients report the extent of nutrient digestion. The apparent digestibility coefficients are a common indicator of feed quality but it is a static measurement normally taken at the end of the small intestine.
- This Technote provides a general background to 'Digestive dynamics' and discusses the merits of involving both static and kinetic components and ileal digestibility coefficients to investigate the kinetics of digestion and absorption.
- The Technote discusses the results of a series of Poultry Research Foundation studies on broiler offered sorghum based diets established to

investigate the relevance of digestive dynamics of starch and protein on broiler performance and nutrient utilization.

5. [Digestive Dynamics of Starch and Protein Part B – factors influencing digestive dynamics in sorghum-based broiler diets.](#)

- This Technote discusses a number of factors that can influence the digestive dynamics of sorghum based broiler diets – grain variety, steam-pelleting (hydrothermal processes and conditioning temperatures) and exogenous enzyme treatment (amylase, protease, phytase and sodium metabisulphite).

6. [Kafirin in sorghum: just how big a villain is this protein fraction?](#)

Authors: Peter Selle, Ha Truong, Sonia Yun Liu.

- Kafirin is the dominant protein fraction in sorghum grain.
- This Technote examines the question “Do biophysical and/or biochemical interactions between kafirin protein bodies and starch granules within the endosperm tangibly compromise utilisation in sorghum based broiler diets – or not?”

7. [An assessment of three grain sorghums by ‘contour plots.](#)

Authors: Sonia Yun Liu, Ha Truong and Peter Selle.

- This Technote discusses the results of a broiler feeding trial specifically designed to interpret variations in the performance of broilers offered nutritionally equivalent diets based on three different grain sorghums, Block I, Liberty and HP.
- Weight gain, feed intake (g/bird), feed conversion ratio, apparent metabolisable energy, apparent metabolisable energy nitrogen correlated, the ratio of metabolisable energy and gross energy, nitrogen retention percentage are measured to examine the effects of the dietary treatments on growth performance and nutrient utilisation.

8. [Additions to the reducing agent sodium metabisulphite in sorghum-based broiler diets based on eight different varieties.](#)

Authors: Ha Truong, Amy Moss, Sonia Yun Liu and Peter Selle.

- Poultry Research Foundation has been interested in sodium metabisulphite (SMBS) addition to sorghum diets since 2011.
- The purpose of this Technote is to provide a summary of the results of a number of SMBS evaluations in sorghum based diets.
- The Technote discusses the responses of broilers offered diets based on eight sorghum varieties to SMBS, the mechanisms of SMBS energy utilisation and Feed Conversion Ratio responses and the future direction of SMBS research and development.

9. [Red versus white sorghums Part 2 – the digestion of amino acids in broiler diets based on red and white sorghums.](#) **Authors: Sonia Yun Liu, Ali Khoddami, Ha Truong, Amy Moss and Peter Selle.**

- In the previous 'red versus white' sorghum Technote, it was suggested that the utilisation of energy from white sorghum is superior to red sorghum.
- The Technote discusses the outcome of a Poultry Research Foundation feeding study to investigate the differences in amino acid digestibility in broilers offered diets based on white (Liberty) and red (Buster) sorghums.
- The Technote will also summarise a subsequent analyses of anti-nutrients including concentrations of non-tannin phenolic compounds and phytate in white and red sorghum.

10. [Sorghum – A feed grain with issues for chicken meat production.](#) **Authors: Peter Selle, Sonia Yun Liu, Ha Truong, Amy Moss and Ali Khoddami.**

- This Technote, being the final Technote in this series, provides a comprehensive précis of sorghum, the feed grain with issues for chicken meat production.
- Key précis topics in this Technote - Sorghum versus wheat, Polyphenols and phenolic acids, Kafirin, Sodium metabisulphite, Grain texture and Bilateral starch and protein availability.