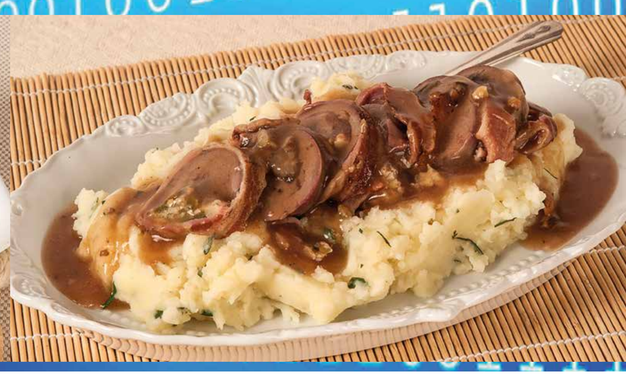
Development of an open access reference database on the nutrient content of South African animal source foods

Schönfeldt, H.C.,* Hall, N.,*
Pretorius, B.* & Van Deventer, M.M. #

* Institute for Food, Nutrition and Well-being, Department of Animal and Wildlife Science, University of Pretoria, Pretoria, Gauteng, South Africa.

School of Health Systems and Public Health, University of Pretoria.
Tel/Fax: +27 12 361 2333 Email: hettie.schonfeldt@up.ac.za



Background

It is of importance to the red meat industry to present the positive nutrient content of local red meat in a meaningful and easily accessible manner to local and international industry, health professionals, academia, media and government. This project proposes to review the nutrient content data of South African red meat, determined through research projects funded by the red meat industry over time, collect the information on a single, internationally recognised database, and extrapolate the data as part of a reference publication on the nutrient content of South African animal source of foods.

Aims of the project

1. To develop a database of nutrient content data generated for South African animal source foods through red meat industry funding over time.
2. Review studies funded by the red meat industry for nutrient content data to include in the database and import the data into the developed database.
3. Share the database with INFOODS as a national, as well as international, open access reference.

Methodology

This project was executed by a team of professionals who have adequate experience in the field of food composition. All members of the team had to qualify to participate.
The requirements stipulated were either:

- An established record of published work on nutrient content data,
- Completed the FAO/INFOODS e-learning Course on Food Composition Data, or
- Participated in a FAO/INFOODS post-graduate course on food composition data.

1. Conduct a desktop review of all previous, completed, Red Meat Research and Development South Africa (RMRD SA) projects which included nutrient content analyses of red meat sources. Specific focus was placed on data presented in:

a. Theses and dissertations
b. Scientific publications
c. Final reports
d. Popular articles
e. Laboratory reports (where available)

Criteria for inclusion included that the data had to be generated in South Africa, within a particular period of time. In the case where quality data was available, although not funded by the red meat industry it was still included in the project.

2. Develop a comprehensive database framework - The FAO/INFOODS Food composition Data Management Systems Compilation Tool version 1.2.1[1] was used as the point of departure to develop a database framework for the current project. Adoption of the database was needed depending on the type of data obtained through the desktop review. Variation in samples was collected and captured to the smallest detail, e.g. different edible parts (cuts) of the same source; different maturity stages (age) and raw, cooked and processed foods need to be included. Furthermore, in the original tool, all foods are categorized in 12 groups, but this research focused on the nutrient content of red meat in particular (Food group 7: Meat and Poultry).

3. Populate the developed database with the data obtained.
All compositional data was standardized to the expression of 100g edible portion on a fresh and cooked weight basis, and according to the FAO/INFOODS Guidelines on Conversion among Different Units, Denominators and Expressions[2]. Data which could not be transformed to this expression was excluded.

Results

The desktop review identified 8 projects that were funded by the RMRD SA. The project that yielded the most data was "The nutritional content of South African beef" which delivered 287 data lines represented by 17 whole carcasses and 15 cuts from 18 carcasses.

Table 1: The nutritient data was represented under the following headings.

Macronutrients	Minerals	Vitamins	Amino Acids		Lipids
Water	Phosphorus	Thiamin	Alanine	Methionine	Saturated fatty acids
Protein	Calcium	Riboflavin	Glycine	Aspartic acid	Monounsaturated fatty acids
Nitrogen	Magnesium	Nicotinamide	Valine	Phenylalanine	Polyunsaturated fatty acids
Ash	Potassium	Pyridoxin	Threonine	Glutamic acid	Cholesterol
Dry matter	Sodium	Folic acid	Serine	Lysine	
Energy	Copper	Cyanocobalamin	Leucine	Tyrosine	
Dietary fibre	Zinc	Biotin	Isoleucine	Arginine	
	Manganese	Pantothenic acid	Proline	Histidine	
	Iron		Hydroxyproline	Tryptophan	
			Cystine		

Data was evaluated for data quality according to relevant sections of the FAO/INFOODS Guidelines on Checking Food Composition Data prior to the Publication of a User Database/Table[3]. In general, the average values of food components given in the original documents were included in the database. If available, the standard deviations (SD) were included as well. The whole process was done by maintaining the integrity of the original data.

Each food entry was listed together with the full bibliographic reference, the food name in English, the scientific name including cultivar/variety/breed or accession name, the compiler ID and, if available, region, season, sample size, and any additional comment if relevant. INFOODS tagnames were used to describe the food components.

Table 2: Example of the food description for each data entry in the FAO/INFOODS Food Composition Data Management Systems Compilation Tool version 1.2.1 and the adapted Red Meat Nutrient Database.

FAO/INFOODS Food composition Data Management Systems Compilation Tool version 1.2.1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Code	Old code	Record number	Country/ region	Food group	Progress	Food type	Food name in English	Food name in French	Food name in own language	Scientific name	Description of food	Processing of food	Season	Sampling naotes	n	Source/ bibloid	Compiler ID

Red Meat Nutritient Database

	A	B	C	D	E	F	G	H	I	J	K
1	Country/region in which research was conducted	Species	Food name in English	Food name in own language	Scientific name	Description of food	Processing of food	Sampling notes	n	Source	Compiler ID

Conclusion

The database generated now holds an archived collection of red meat nutritional data, funded by Red Meat Research and Development South Africa. The database will serve as a valuable reference source for the industry on local meat products. It could be used by other researchers, health professionals and government if applicable.

Acknowledgments

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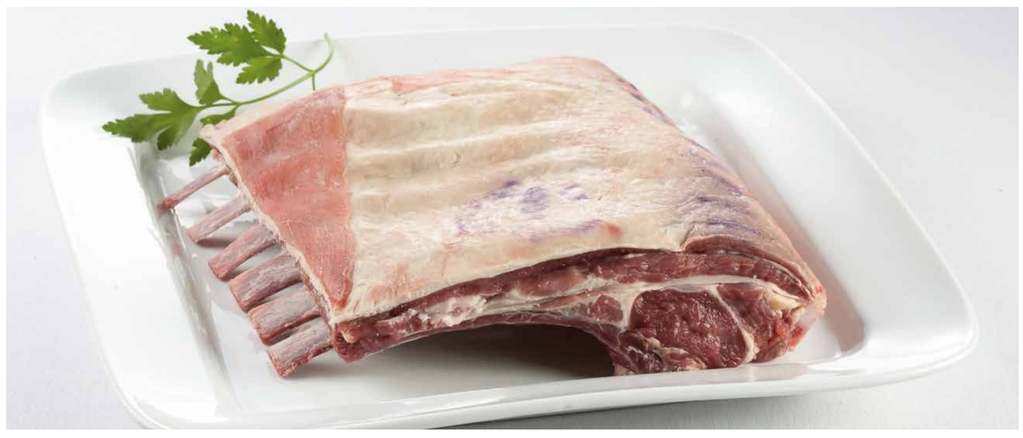

References

1 FAO/INFOODS, (2012c). Compilation Tool version 1.2.1. Available at http://www.fao.org/infoods/infoods/software-tools/en/.

2 FAO/INFOODS, (2012b). FAO/INFOODS Guidelines on Conversion among Different Units, Denominators and Expressions. Available at http://www.fao.org/infoods/infoods/standards-guidelines/en/.

3 FAO/INFOODS, (2012d). FAO/INFOODS Guidelines on Checking Food Composition Data prior to the Publication of a User Database/Table. Available at http://www.fao.org/infoods/infoods/standards-guidelines/en/.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
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