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Probiotics Reference Guide

An In-House Developed Probiotics Database E-Reference Information for Healthcare Professionals

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Probiotics

- Definition (WHO)!:
 - "Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host."
- Health supplements
- Prevention/treatment of various medical conditions

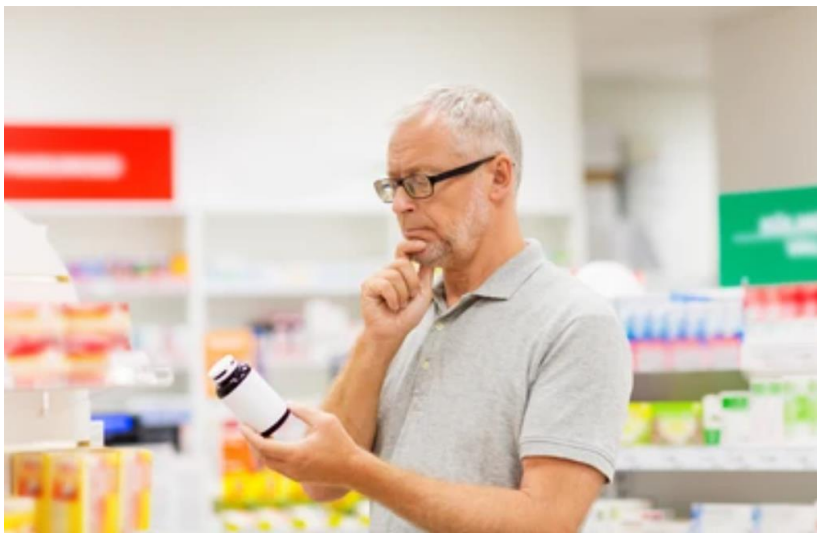


Not *any* product may be suitable for a given consumer...





Case Example



- John, 60yo male, NKDA
- Developed diarrhoea while on Augmentin® (antibiotic) for an ear infection





Challenges faced by HCPs when providing recommendations

- Probiotic efficacy is influenced by multiple factors¹
 - Strain-specificity, Disease-specificity, Mode of therapy
- Insufficient knowledge among healthcare professionals (HCPs)²
- Existing resources may not be regularly updated or do not provide product-specific information

1. Sniffen et al (2018). *PLoS one*, 13(12), e0209205.

2. Fijan et al (2019). *International journal of environmental research and public health*, 16(17), 3128.



HCPs need to be knowledgeable on probiotics to effectively address queries from consumers

- Consumers expect HCPs to be knowledgeable about complementary medicines, including probiotics¹

Baseline results from an in-house survey on pharmacists:

88%

Received **probiotic-related queries** in the past year

88%

Low-medium knowledge of probiotics

68%

Unable to find appropriate clinical evidence for products using *existing* references (eg. product label, clinical studies)

Emphasises the need for a curated resource for clinical information on probiotics

1. Braun et al (2010). *BMC Complementary and Alternative Medicine*. 10(1):38.



Gaps in existing clinical resources

	Efficacy evidence of probiotic strains	Regularly updated	Product-specific information
Primary literature	✓	-	May not specify product used
International guidelines (WGO 2017) ¹	✓	X	X
Drug/Clinical database (UpToDate) ²	✓	✓	X
Complementary medicines database (Natural Medicines Database) ³	✓	✓	X
Probiotics database (USA Probiotics Guide) ⁴	✓	✓	Only products available in the USA

1. World Gastroenterology Organisation Global Guidelines (2017). Probiotics and prebiotics.
2. Wolters Kluwer Health. UpToDate. Retrieved from: <https://www.uptodate.com/>

3. Therapeutic Research Center Healthcare. Natural Medicines Database. Retrieved from: <https://naturalmedicines.therapeuticresearch.com/>
4. AEPProbio. Clinical guide to probiotic products available in USA. Retrieved from: <http://www.usprobioticguide.com/>



Objectives

- Develop an electronic web database (Probiotics Reference Guide) providing comprehensive & practical probiotics practice reference information
- Evaluate the quality, user-friendliness & applicability of the database in healthcare practice



Which probiotics are suitable for John's condition?



- John, 60yo male, NKDA
- Developed diarrhoea while on Augmentin® (antibiotic) for an ear infection



Probiotics Reference Guide Web Database

Probiotics Reference Guide

Clinical Evidence for Probiotics in Singapore

[Home](#) [Search by Indication](#) [Search by Product](#) [Search by Strain](#) [About Us](#) [About the Project](#) [Terms of Use](#)

Welcome to the Probiotic Reference Guide

Please familiarise yourself with the information below as well as the [Standard Terms & Conditions](#) before using this website.

Search by Indication

Search the database for products that contain probiotic strain(s) with clinical evidence for a specific indication, usage (Treatment/Prevention) & age group (Adult/Children). This feature may be useful if you want to know about what are the probiotic products available for a given customer with a specific profile (indication, usage, age group).

 Search

Search by Product

Search the database for a specific probiotic product. This feature may be useful if you want to know the key information (including probiotic content, dosage form, dosage regimen) for a specific product, or whether there are any published literature available for the probiotic(s) that constitute the product.

Search

Search by Strain

Search the database for a product containing specific probiotic(s). This feature may be useful if you want to look for products containing a specific combination of probiotic(s) and is available in Singapore.

Search

3 search
features



Search by Indication

Search by Indication

Please select the indication, intended use & age group below.

Indication:

Usage:

☒ Treatment ☐ Prevention

Age Group:

☒ Adults ☐ Children

Gastrointestinal

- Constipation
- Diarrhoea (Acute)
- Diarrhoea (Antibiotic-associated)
- Diarrhoea (Traveller's)
- Dyspepsia
- Gastroenteritis
- H.pylori Infections
- Irritable Bowel Syndrome
- Lactose Intolerance

Genitourinary

- Bacterial Vaginosis
- Vulvovaginal Candidiasis
- Urinary Tract Infection

Oral

- Bad breath (Halitosis)
- Gum disease (Gingivitis, Periodontitis)
- Oral Candida
- Tooth decay (Caries)

Respiratory

- Upper Respiratory Tract Infections (URTI)

Skin

- Eczema

Others

- Infant Colic



Search by Indication: Results page

Summary of search results

Key product information

Summary of relevant studies

Search Results (by Indication)

There are 53 result(s).

The following are product(s) containing probiotic strain(s) that have published evidence for the **Treatment of Diarrhoea (Antibiotic-associated) in Adults**.

Note: The order of products in the list below are not sorted in any particular manner. Do exercise professional judgement while assessing the information.

OptiBac Probiotics for Those on Antibiotics

Key Product Details:

- Marketed Indication(s): Maintain digestive health & immunity when taking antibiotics
- Probiotic Strain: Lactobacillus rhamnosus Rosell-11, Lactobacillus acidophilus Rosell-52 (Contains 2 type(s) of probiotics)
- Total Strength: 4 billion CFU/capsule
- Dosage Form: Capsule
- Contains Prebiotics: -



Key Study Details:

- Total no. of relevant studies: 1 (Efficacious: 1; Uncertain: 0; Inefficacious: 0)

Details

Details on product & relevant studies

OptiBac Probiotics for Bowel Calm

Key Product Details:

- Marketed Indication(s): Fast acting bowel calm, comfort & control (eg. Diarrhoea, IBS, Candida)
- Probiotic Strain: Saccharomyces boulardii (Contains 1 type(s) of probiotics)
- Total Strength: 5 billion CFU/capsule
- Dosage Form: Capsule
- Contains Prebiotics: -



Key Study Details:

- Total no. of relevant studies: 2 (Efficacious: 2; Uncertain: 0; Inefficacious: 0)

Details



Details page – Product

Probiotic components & usage information

Suitability & storage information

Other ingredients

OptiBac Probiotics for Those on Antibiotics

Product Details:

Probiotic Strain(s):	Lactobacillus rhamnosus Rosell-11, Lactobacillus acidophilus Rosell-52 (Contains 2 type(s) of probiotics)	
Total Strength:	4 billion CFU/capsule	
Marketed Indications:	Maintain digestive health & immunity when taking antibiotics	
Dosage Regimen:	Dosage:	1 capsule daily
	Duration:	Take every day during antibiotic course & for a few days after.
Minimum Age:	1 year old and above	
Suitable for:	• Pregnancy: Yes • Lactation: - • Vegetarian: Yes • Halal: -	
Storage:	Store below 25C in a dry place, away from direct sunlight.	
Flavour:	-	
Prebiotics:	-	
Other Key Ingredients:	-	
Other Inactive Ingredients:	Filler: potato starch; vegetarian capsule: hydroxypropyl methylcellulose; anticaking agent: vegetable magnesium stearate; antioxidant: ascorbic acid	





Details page – Studies

Summary of
efficacy & key
study information

Summary of
study quality
assessment

Study Details (for Selected Indication, Use & Age Group):

Study 1: Treatment of Antibiotic-associated Diarrhoea in Adults	
Efficacy:	Efficacious (OCERBM Level : 2)
Strain(s) studied:	Lactobacillus helveticus R0052, Lactobacillus rhamnosus R0011 (4B CFU/capsule, 1 capsule twice a day for 14 days)
Strength of Link:	• Genus: Complete match • Species: Complete match • Strain(s): Complete match (all strains of product matched those of study)
Group(s) studied:	All subjects were healthy adults. Subjects were randomised to receive 1 week of amoxicillin-clavulanic acid (875mg/125mg) once per day, plus a daily dose of 8 billion CFU of a multi-strain probiotic (n=80, intervention group) or placebo (n=80, control group).
Remarks:	A post hoc analysis on the duration of diarrhoea-like defecations showed that probiotic intervention reduced the length of these events by 1 full day (probiotic, 2.70 (SEM 0.36) days; placebo, 3.71 (SEM 0.36) days; p=0.037; effect size=0.52)
Assessment of Study Quality:	Assessed with Cochrane Risk of Bias Version 2.0 Overall bias: Low risk Bias due to randomization: Low risk Bias due to deviations from intended interventions: Low risk Bias due to missing outcome data: Low risk Bias in measurement of outcome: Low risk Bias in selection of reported result: Low risk Click here to view the full RoB assessment
Reference:	Evans M, Salewski RP, Christman MC, Girard SA, Tompkins TA. Effectiveness of Lactobacillus helveticus and Lactobacillus rhamnosus for the management of antibiotic-associated diarrhoea in healthy adults: a randomised, double-blind, placebo-controlled trial. The British journal of nutrition. 2016;116(1):94-103. Epub 2016/05/14. doi: 10.1017/s0007114516001665. (Link to Article)

Information updated on: 23 Aug 2022

Full Details (all indications)

Published evidence available for that
combination of probiotic(s)



I heard about “**Biogaia Protectis Chewable Tablets**” from a friend.
Any idea if this is useful for antibiotic-associated diarrhoea?





Search by Product

Search by Product

Please type in the name of the product you want to search for in the field below.

Tip: Keep your search terms general (eg. by just searching for the brand name of a product) and avoid searching with many words.

Search Results (by Product)

There are 2 result(s).

Note: The order of products in the list below are not sorted in any particular manner. Do exercise professional judgement while assessing the information.

Biogaia Protectis Chewable Tablets (Strawberry)



- Marketed Indication(s):
For gut comfort
- Probiotic Strain:
Lactobacillus reuteri
DSM 17938 (Contains 1 type(s) of probiotics)
- Total Strength: 100 million CFU/tablet
- Dosage Form: Chewable Tablet
- Contains Prebiotics: -

[Full Details](#)

Biogaia Protectis Chewable Tablets (Lemon)



- Marketed Indication(s):
For gut comfort
- Probiotic Strain:
Lactobacillus reuteri
DSM 17938 (Contains 1 type(s) of probiotics)
- Total Strength: 100 million CFU/tablet
- Dosage Form: Chewable Tablet
- Contains Prebiotics: -

[Full Details](#)

Full product &
study details



Full details page: information on product & associated studies

Biogaia Protectis Chewable Tablets (Lemon)

Product Details:

Probiotic Strain(s):	Lactobacillus reuteri DSM 17938 (Contains 1 type(s) of probiotics)
Total Strength:	100 million CFU/tablet
Marketed Indications:	For gut comfort
Dosage Regimen:	Dosage: 1 tablet daily (max 2 tablets/day) Duration: -
Minimum Age:	-
Suitable for:	- Pregnancy: - - Lactation: - - Vegetarian: - - Halal: -
Storage:	Store below 25°C in a dry place, away from direct sunlight.
Flavour:	Lemon
Prebiotics:	-
Other Key Ingredients:	-
Other Inactive Ingredients:	Isomalt, xylitol, natural lemon flavoring and citric acid.



Study Details:

Constipation

Total Studies: 8 (Efficacious: 5, Uncertain: 2, Inefficacious: 1)

+

Diarrhoea (Acute)

Total Studies: 3 (Efficacious: 3, Uncertain: 0, Inefficacious: 0)

+

Diarrhoea (Antibiotic-associated)

Total Studies: 4 (Efficacious: 3, Uncertain: 1, Inefficacious: 0)

-

Study 1: Prevention of Antibiotic-associated Diarrhoea in Children	
Efficacy:	Uncertain (OCERBM Level : 1)
Strain(s) studied:	Lactobacillus reuteri DSM 17938
Strength of Link:	- Genus: Complete match - Species: Complete match - Strain(s): Complete match (all strains of product matched those of study)
Group(s) studied:	Subjects: Hospitalized patients
Remarks:	-
Assessment of Study Quality:	Not assessed.
Reference:	Urbanska M, Gieruszczak-Bialek D, Szajewska H. Systematic review with meta-analysis: Lactobacillus reuteri DSM 17938 for diarrhoeal diseases in children. <i>Alimentary pharmacology & therapeutics</i> . 2016;43(10):1025-34. Epub 2016/03/19. doi: 10.1111/apt.13590. (Link to Article)

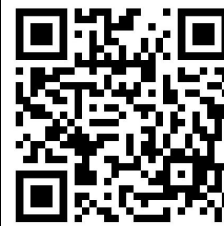
Existing studies are for *prevention* but not treatment

Study 2: Prevention of Antibiotic-associated Diarrhoea in Adults

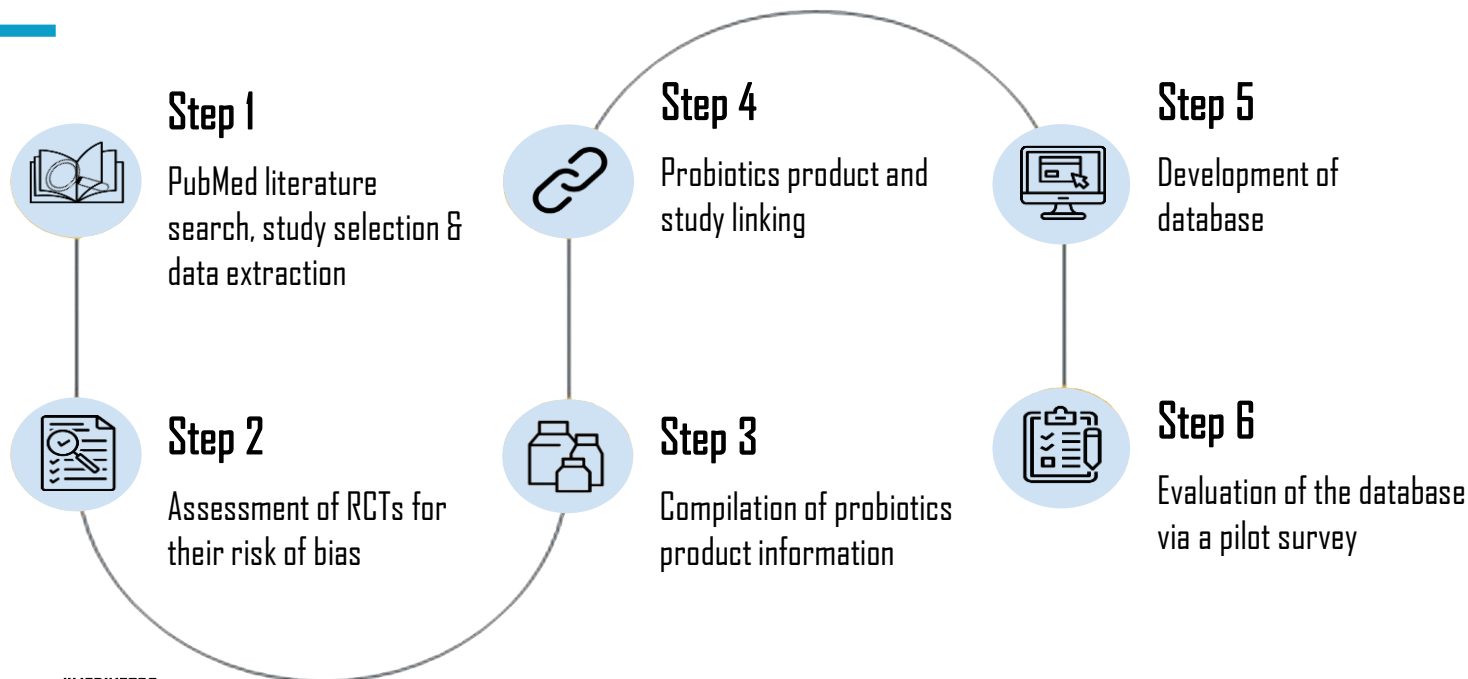


Thanks for the advice! I will go with your initial recommendation instead.





Development of the Probiotics Reference Guide





Content of the Probiotics Reference Guide

Probiotic Products

8

Physical stores

7

Online retailers

753

Probiotic products

147 single-strain
606 multi-strain



Product-
study link

Clinical Studies

556

PubMed articles
(2008 – Jun 2022)

859

Unique study
excerpts



[Front Med \(Lausanne\)](#), 2021; 8: 776955.

Published online 2021 Nov 18. doi: [10.3389/fmed.2021.776955](#)

PMCID: PMC8637152

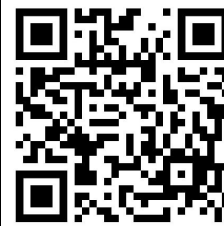
PMID: [34869495](#)

Saccharomyces boulardii Combined With Quadruple Therapy for *Helicobacter pylori* Eradication Decreased the Duration and Severity of Diarrhea: A Multi-Center Prospective Randomized Controlled Trial

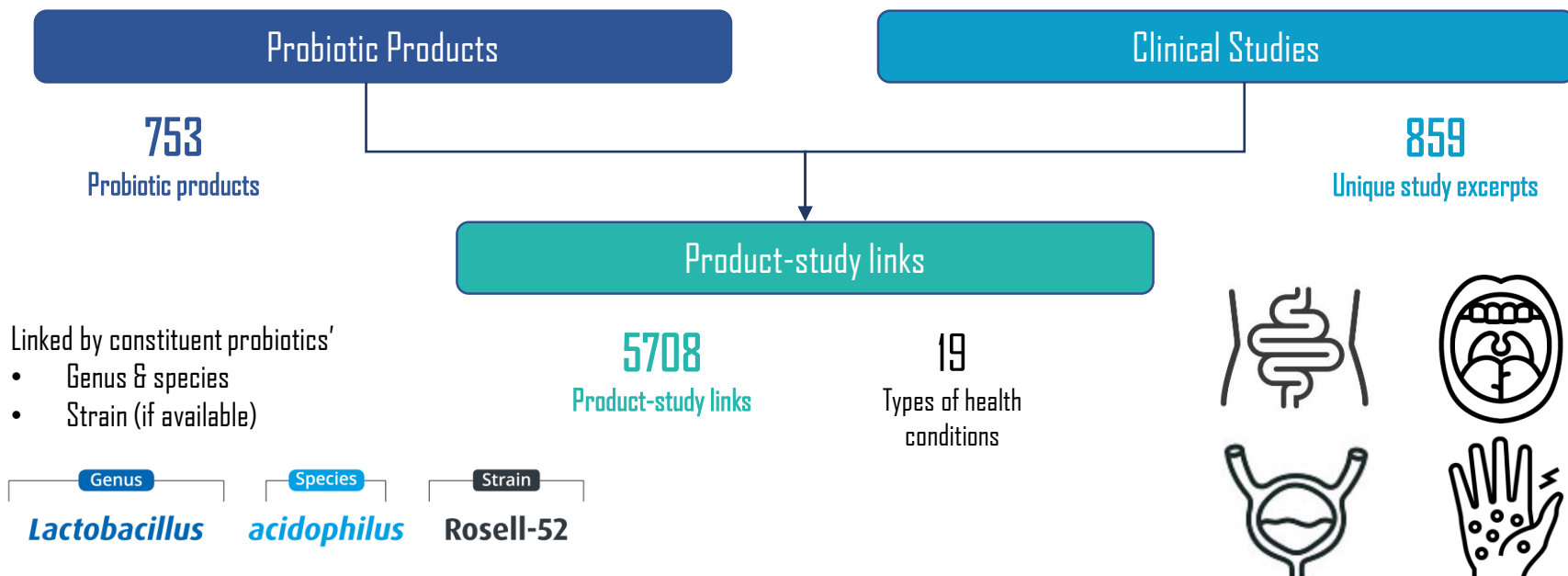
Yuchong Zhao,^{1,*} Yilei Yang,^{1,*} Aruna,¹ Jun Xiao,² Jun Song,³ Tizheng Huang,⁴ Shuyu Li,⁵ Jiguang Kou,⁶ Lu Huang,⁷ Dexiong Ji,⁸ Si Xiong,¹ Wang Peng,¹ Sanping Xu,^{9,*} and Bin Cheng^{1,*}

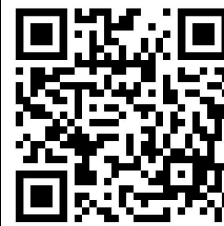
Conclusion: *Saccharomyces boulardii* ameliorated *H. pylori* eradication-induced antibiotic-associated side effects especially reduced the incidence of severe diarrhea and the duration of diarrhea. However, there was no significant effect of *S. boulardii* on the rate of *H. pylori* eradication.

Data for different indications/study groups were extracted as *excerpts*



Content of the Probiotics Reference Guide

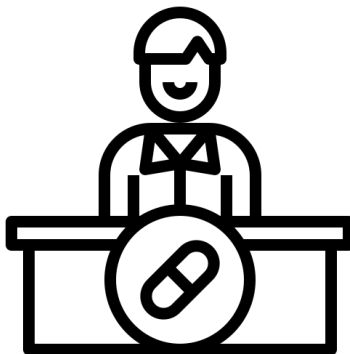




Survey evaluation among practising pharmacists

13

Hospital Pharmacists
From 7 different institutions



12

Community Pharmacists
From 2 different organisations

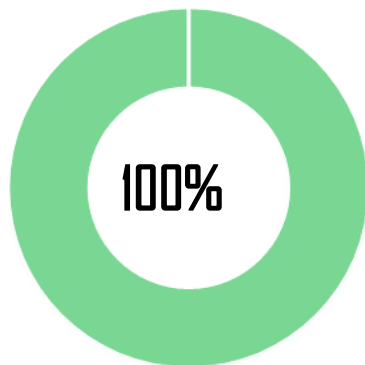
USER-FRIENDLINESS

QUALITY

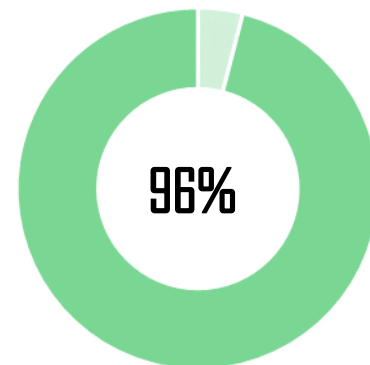
APPLICABILITY



User-friendliness: well-designed & easy to use



Easy to navigate, clear terminology & quick results generation



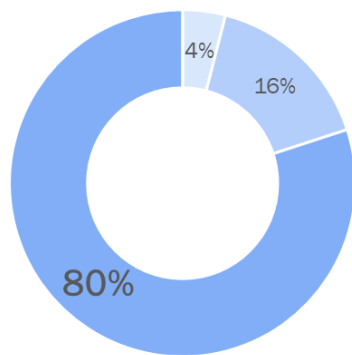
■ Neutral
■ Agree and Strongly Agree

Flexibility with different search functions

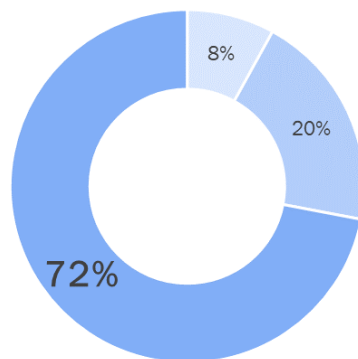


Quality: comprehensive source for probiotics information

Completeness of information



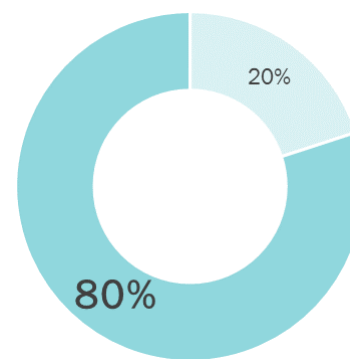
Indications



Products

Strongly Disagree and Disagree
Neutral
Agree and Strongly Agree

Relevance of information

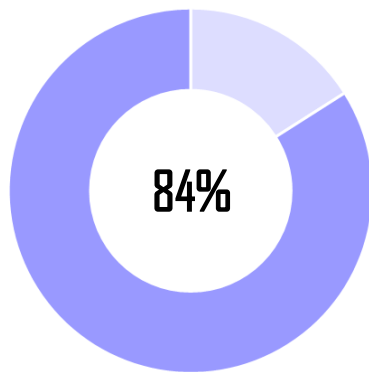


Neutral
Agree and Strongly Agree

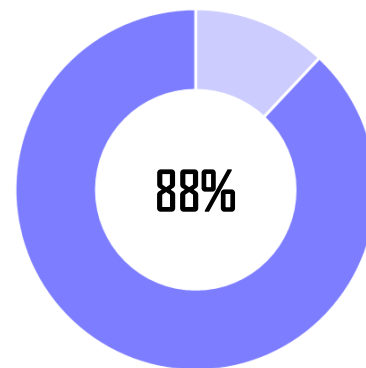
Summary of study efficacy helped users make an informed decision on products



Applicability: effective tool to assess efficacy & learn about probiotics



- ✓ Product-study links: useful to assess efficacy of products
- ✓ Address queries more confidently & promptly



- Neutral
- Agree and Strongly Agree

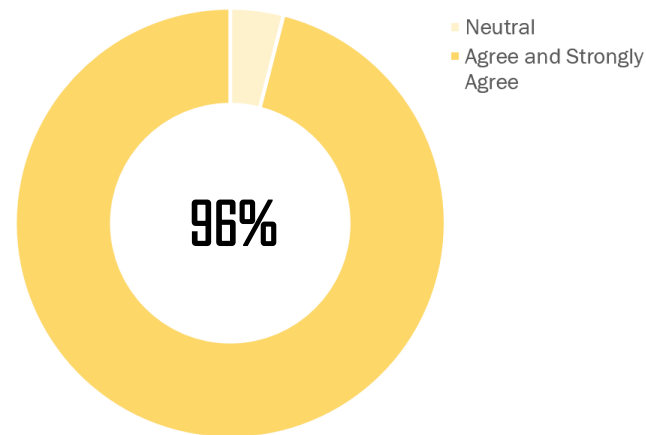
Improved knowledge of probiotics



Interest in the continued use of the database

Overall, majority of participants will:

- ✓ Continue to use the database as a reference for probiotics information
- ✓ Recommend the database to other pharmacists





Centralised platform for information on probiotics products & published studies

	Efficacy evidence of probiotic strains	Regularly updated	Product-specific information
Primary literature	✓	-	May not specify product used
International guidelines (WGO 2017) ¹	✓	X	X
Drug/Clinical database (UpToDate) ²	✓	✓	X
Complementary medicines database (Natural Medicines Database) ³	✓	✓	X
Probiotics database (USA Probiotics Guide) ⁴	✓	✓	Only products available in the USA
Probiotics Reference Database	✓	✓	✓

1. World Gastroenterology Organisation Global Guidelines (2017). Probiotics and prebiotics.
2. Wolters Kluwer Health. UpToDate. Retrieved from: <https://www.uptodate.com/>

3. Therapeutic Research Center Healthcare. Natural Medicines Database. Retrieved from: <https://naturalmedicines.therapeuticresearch.com/>
4. AEPProbio. Clinical guide to probiotic products available in USA. Retrieved from: <http://www.usprobioticguide.com/>



Conclusion

- ✓ The Probiotics Reference Guide was developed to provide HCPs with an **integrated resource** enabling quick and easy access to detailed information on probiotic products and clinical studies.
- ✓ Survey participants generally found the Probiotics Reference Guide to be **user-friendly, of good quality and applicable** to their daily practice.
- ✓ Potential to be a reliable e-reference for probiotics.



Thank you!

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**SDAAI: Specialist Diploma in Applied AI*

#CBDSA: Certified Big Data Science Analyst

^CME: Certified Metaverse Expert™



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