



Fibers for Life.

Cellulose for Pet Food

MULTI-FUNCTIONAL. SCIENTIFICALLY PROVEN.



FIBER ENRICHMENT

- Improves stool quality (fecal bulk)
- Calorie free ingredient
- Non digestible, insoluble fiber
- Promotes satiation for weight control



STRUCTURE AND STRENGTH

- Prevents breakage in finished products
- Improves kibble stability and uniformity
- Increases chew time



PROCESSING STABILITY

- Prevents syneresis and gel separation
- Stable in pH and high heat environments
- Interacts well with other ingredients



OVERALL PET HEALTH

- Improves digestive system
- Reduces hairball incidences¹
- Enhances dental hygiene and plaque removal²
- Increased nutrient digestibility³
- Promotes positive palatability
- Helps prevent diseases



JRS FIBERS

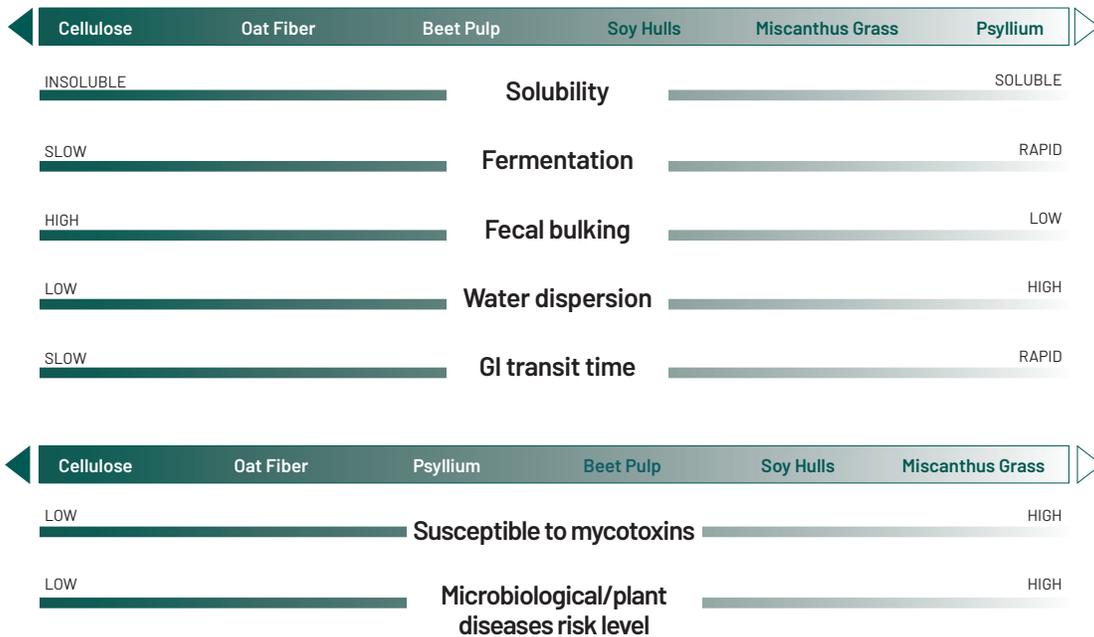
Isolating or extracting cellulose from various plant sources, requires unique technology and is not easily replicated. J. Rettenmaier’s global group of companies has a long standing history since 1878 in providing unique cellulose fiber ingredients to a multitude of industries. For over 25 years, JRS USA has been producing high quality cellulose ingredients for the pet food industry.

While a variety of plant sources are used as our starting raw material, the most common source is virgin wood-based pulp isolated from trees. Trees offer the most abundant, renewable source of cellulose fiber without compromising other viable human food sources.

CELLULOSE FACTS

Powdered cellulose meets the Food Chemicals Codex (FCC) Monograph and has been a safe food additive since 1958. It also meets the FDA approval under 21 CFR 176.170 and was recently approved under new Dietary Fiber guidelines established 2016. In 1976, the Association of American Feed

Control Officials(AAFCO) 87.14 defined powdered cellulose as purified cellulose obtained from pulp from fibrous plant materials. This definition makes the pulping process critical to isolating only pure cellulose molecules. These diagrams demonstrate how cellulose compares to other fibers.



¹Beynen, A.C., Middelkoop, J., & Saris, D.H.J. (2011). Clinical Signs of Hairballs in Cats Fed a Diet Enriched with Cellulose. *American Journal of Animal and Veterinary Sciences*, 6.
²Beynen, A.C., Altena, F.V., & Visser, E.A. (2010). Beneficial Effect of a Cellulose-Containing Chew Treat on Canine Periodontal Disease in a Double-Blind, Placebo-Controlled Trial. *American Journal of Animal and Veterinary Sciences*, 5(3), 192-195.
³Manohar, C.B., Abhilekha, P.M., & Sharadamma, K.C. (2012). Evaluation of Dietary Fiber Source in Extruded Diet on Nutrient Digestibility in Dogs. *Thai Association for Laboratory Animal Science*, 280.

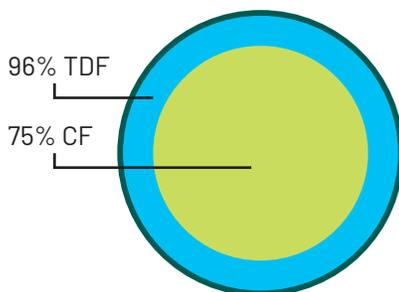


JRS FIBER COMPARISON

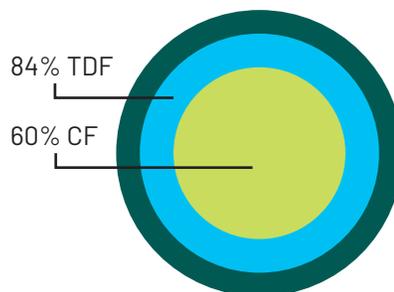
Our products are pure, with no dangers of mycotoxins like aflatoxins, leaf blight or microbials such as listeria, which may be found in ingredients derived from roughage and grasses. Cellulose is the most abundant organic compound found in nature and with JRS supporting the Green Forest Initiative, you can be sure that these highly sustainable products will be around for years to come.

Our technical experts and state-of-the-art lab equipment are accessible to help your development team formulate an optimal pet food product. JRS offers a wide variety of powdered cellulose and other fibers to create your next unique, highly functional, label compliant and nutritionally balanced finished product. Contact your local sales representative to ask how we can help you achieve your next formulation project goals.

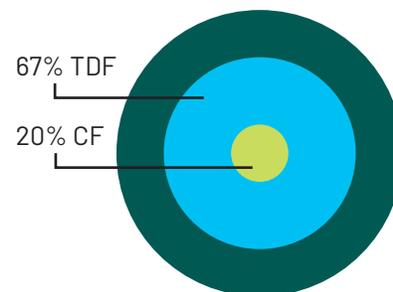
JRS POWDERED CELLULOSE



ROUGHAGE/ GROUND GRASS



BET PULP



TDF: Total Dietary Fiber
CF: Crude Fiber

JRS CELLULOSE ADVANTAGES

- Meets AAFCO definition
- Non-digestible, calorie free
- 73 - 75% crude fiber
- Sustainable resource
- Neutral flavor for proven palatability
- Produced in SQF Certified facilities
- Not susceptible to mycotoxins
- Manufactured in USA
- Non GMO, gluten-free, allergen-free
- Inert to low microbiological levels
- Scientifically proven



Fibers for Life.



SUSTAINABLE



JRS SUSTAINABLE SOURCES

J. Rettenmaier USA LP sources pulp exclusively from suppliers with ecological initiatives and environmental policies that include sustainable forest management and efforts to use fewer resources. Pulp is procured from approved suppliers in the US and Canada that are certified by forest certification programs such as the Forest Stewardship Council® (FSC), the Sustainable Forest Initiative (SFI) or the Programme for the Endorsement of Forest Certification (PEFC).

