

THE DOGGIE BAG study

Determination Of Gluten Grams Ingested and Excreted By Addult eating Gluten-free

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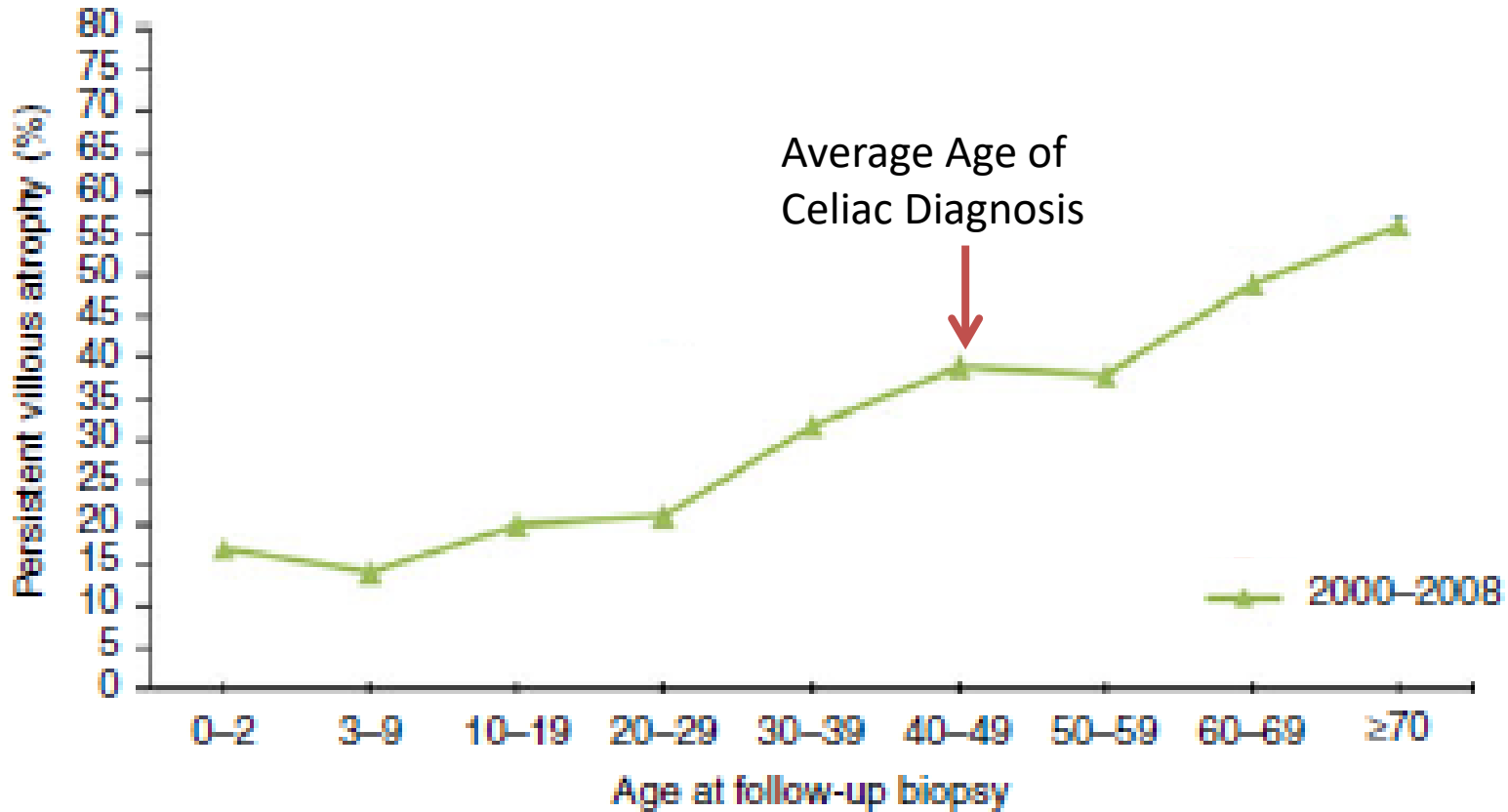
University of Manitoba

Chair CCA PAC

Celiac Disease

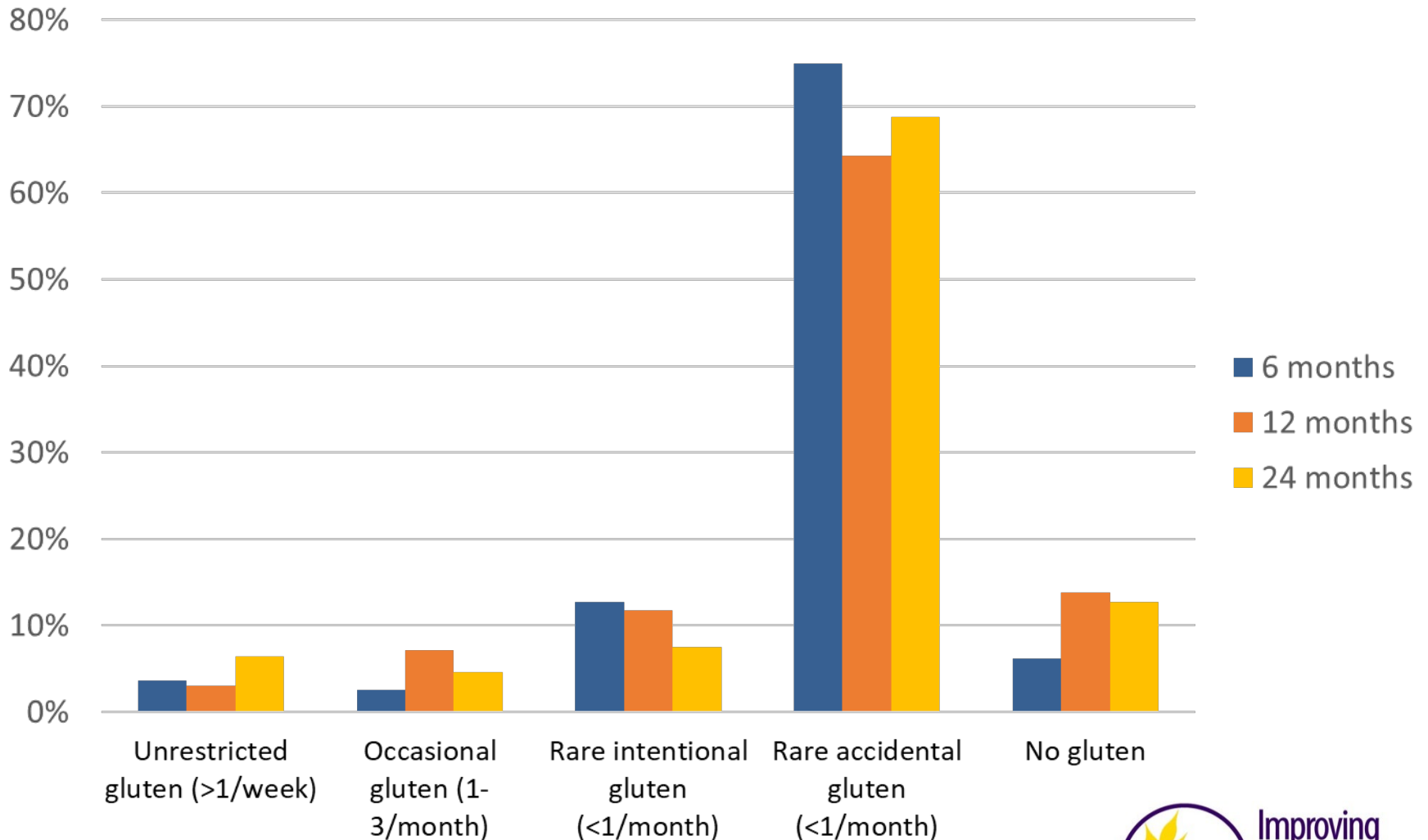
- Correct Diagnosis
 - Serology
 - Biopsy
- Correct Treatment
 - Gluten Free Diet
 - Knowledge
 - Motivation
 - Social Adaptability
- Optimal Outcome
 - Symptoms resolve, antibodies disappear, biopsies normalize

Why doesn't a gluten-free diet result in intestinal recovery?



1/3 of people have a healthy intestine after 2 years
2/3 of people have a healthy intestine after 5 years

GF-EAT in Manitoba Celiac Cohort



Silvester, Duerksen et al., unpublished data.

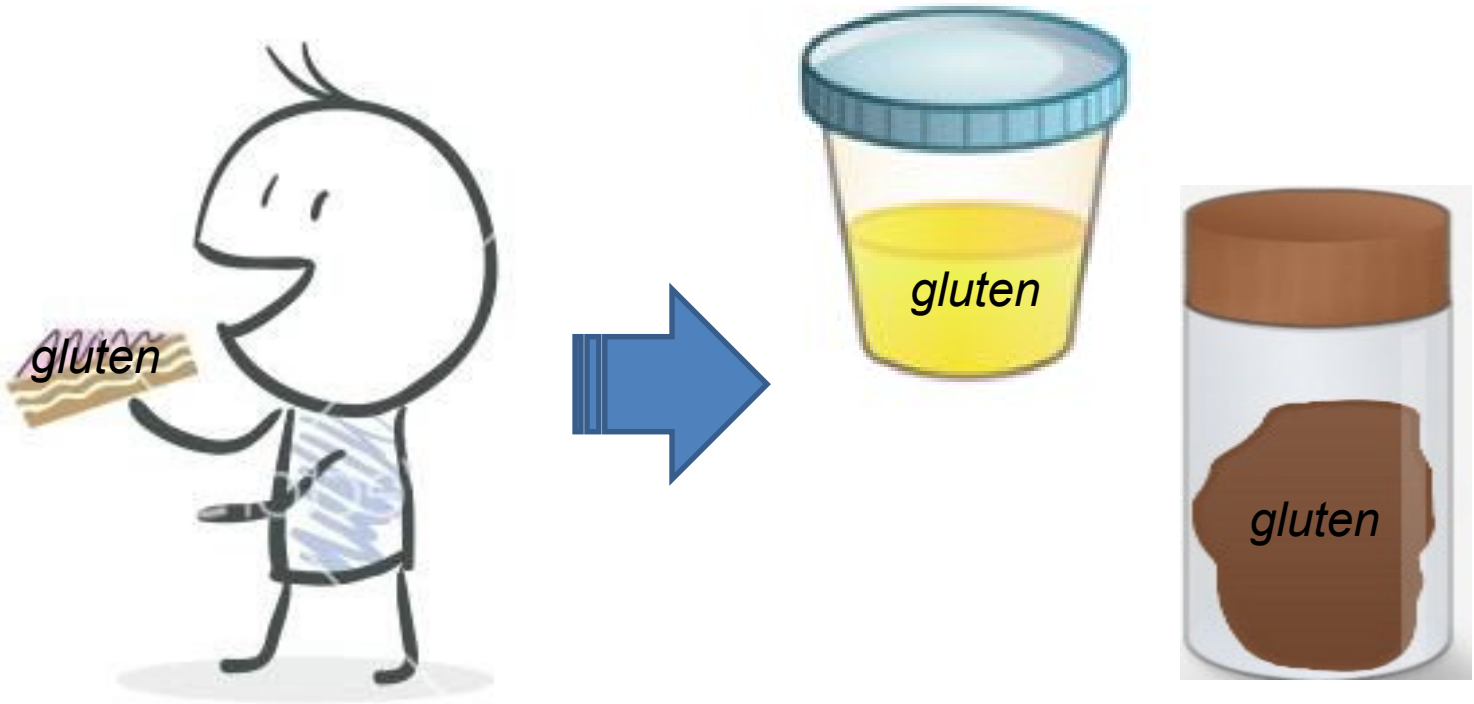


Gluten as a biomarker of gluten ingestion



Gluten In

Gluten as a biomarker of gluten ingestion



Gluten In

Gluten Out

“DOGGIE BAG” Study

Determination Of Gluten Grams Ingested and Excreted By Addult eating Gluten-free

- Prospective study
- 18 Manitoba Celiac Disease cohort participants
(& 3 controls on a normal diet)
- 24 months on GFD
- 10-day sample & data collection
 - Food (25% of all food – hence “doggie” bag)
 - Stool
 - Urine



Study Design



Wash Through

Food record

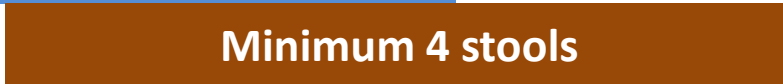


Food collection



N = 21

Stool collection



N = 4+

Urine collection



N = 30

Study day

1	2	3	4	5	6	7	8	9	10	11
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Biopsy

●

Blood draw

●

Survey/interview

●



The big picture: Celiacs on a GFD (n = 18)

	Total Samples	Positive Samples	Individuals with positive sample
Food	318	25 (8%)	10
Urine	519	30 (6%)	8
Stool	72	8 (11%)	4



The big picture: Celiacs on a GFD (n = 18)

	Total Samples	Positive Samples	Individuals with positive sample
Food	318	25 (8%)	10
Urine	519	30 (6%)	8
Stool	72	8 (11%)	4

12/18 (66%) had at least one positive sample

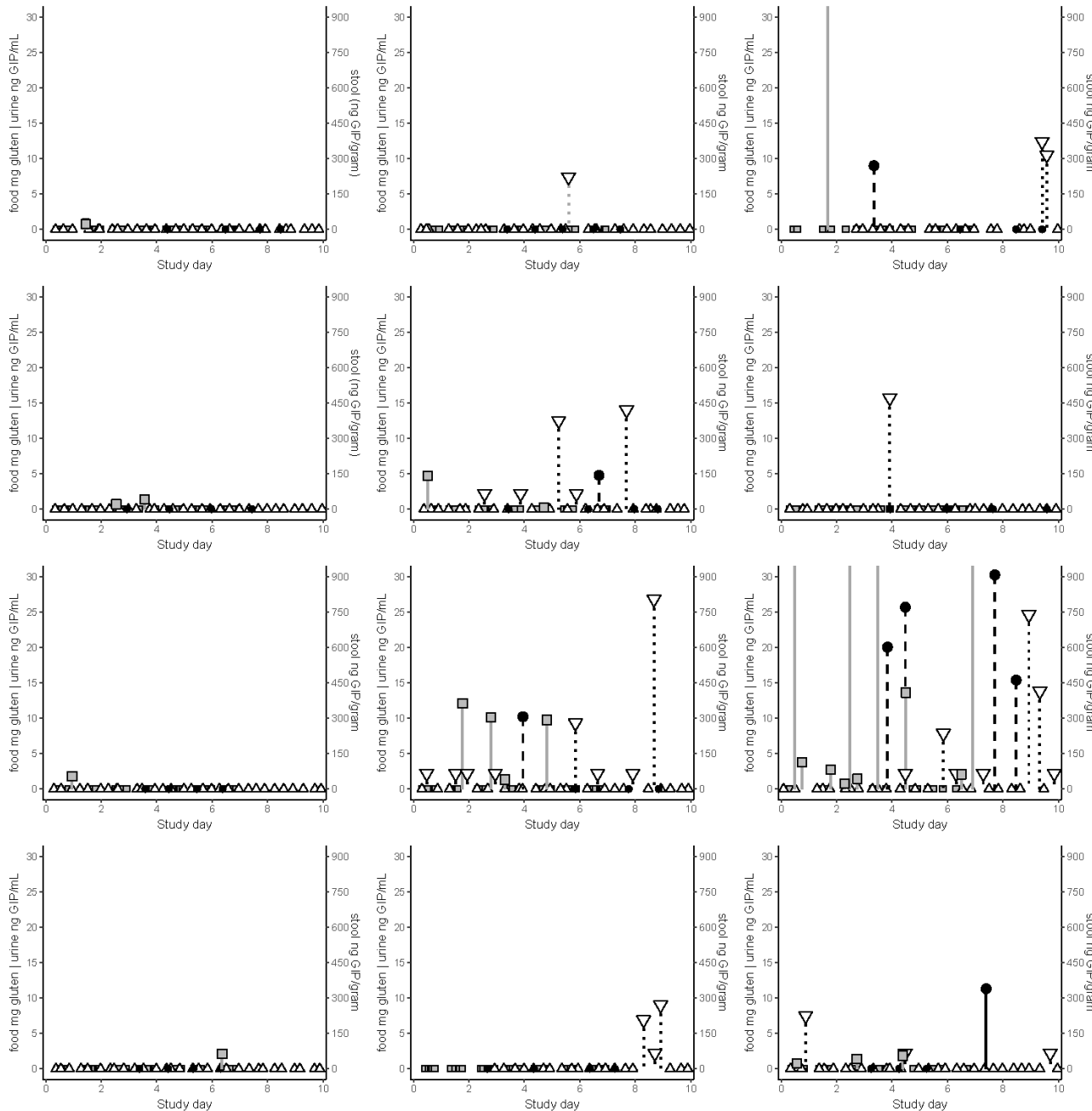


Gluten Ingestion

- Range of gluten detected in food
 - .2 mg to 80 mg
 - 7 samples were greater than 25 mg
- Gluten ingestion occurred at all meals but more commonly lunch and supper
 - 5/25 were breakfast
- Gluten ingestion was well distributed on all days of the study



Gluten in a “gluten-free diet”



- Food
- ▽ Urine
- Stool

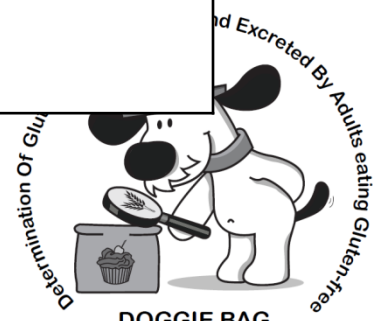
Silvester, Sousa, Duerksen et al., unpublished data.



Gluten Ingestion: Example 1

Estimated mg GIP	Study ID	Day eaten	Time eaten (24 hr clock)	Foods in positive sample	Notes
10.1	12	3	16.30	PB&J sandwich bar	GF labeled oat product
			19.15	GF spaghetti, parmesan cheese	GF labeled pasta
			21.00	Cheesecake	GF label

Silvester, Sousa, Duerksen et al., unpublished data.



Gluten Ingestion: Example 2

Estimated mg GIP	Study ID	Day eaten	Time eaten (24 hr clock)	Foods in positive sample	Notes
0.2	11	5	17.00	Cheese flavor corn chips, hard caramel candies	Chips labelled gluten-free

Silvester, Sousa, Duerksen et al., unpublished data.



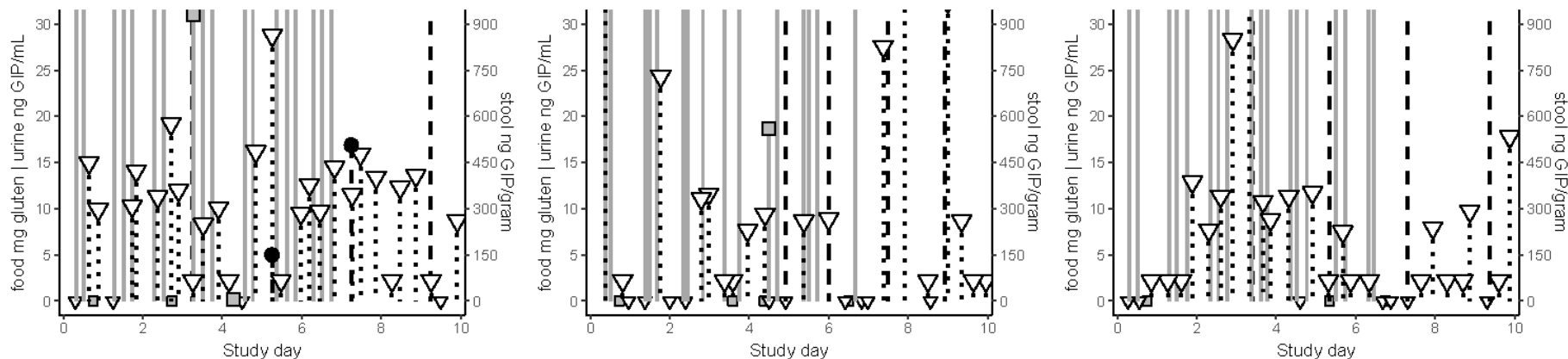
Gluten Ingestion: Example 3

Estimated mg GIP	Study ID	Day eaten	Time eaten (24 hr clock)	Foods in positive sample	Notes
80	16	1	11.30	Hamburger, potatoes	Symptomatic, not suspected.

Silvester, Sousa, Duerksen et al., unpublished data.



How much gluten is in a “normal diet”?



Wash Through

Food record



■ Food collection

25% of all food and some beverages*

N = 21

● Stool collection

Minimum 4 stools

N = 4+

▽ Urine collection

3 samples per day

N= 30

Study day

1 2 3 4 5 6 7 8 9 10 11

Gluten Ingestion: Timing

8 episodes of documented gluten ingestion associated with positive urine – 2-49 hours

9 episodes of documented gluten ingestion associated with positive stool – 2-4 days

4 patients had small gluten exposures (<2.1 mg) and had no GIP in stool or urine



Gluten exposures are unsuspected

- Participants recorded each day
 - If they had symptoms of gluten exposure
 - If they thought they had consumed gluten (and which foods)
- Only 4/25 (16%) exposures were suspected based upon symptoms
 - 1/6 (17%) exposures > 25 mg
- 4/7 with no suspected exposures had at least one positive sample



... And suspected gluten exposures are not associated with gluten detection

- 11/18 participants suspected a gluten exposure
 - 8 had at least one positive sample

Silvester, Sousa, Duerksen et al., unpublished data.



... And suspected gluten exposures are not associated with gluten detection

- 11/18 participants suspected a gluten exposure
 - 8 had at least one positive sample

Only 2 participants correctly identified the culprit food when gluten exposure was suspected (2 samples)



Conclusions

- Gluten ingestion occurs frequently on a 'Gluten Free Diet'
- These ingestions are usually small amounts and frequently not suspected by individuals on a gluten free diet

Conclusions

- What is the clinical significance of these ingestions?
 - Failure of histology to normalize?
 - Symptoms?
 - Complications?
- Are thresholds of gluten ingestion for causing musocal injury different for different individuals?
- Further study is needed

Thank you!



CELIAC RESEARCH PROGRAM

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