

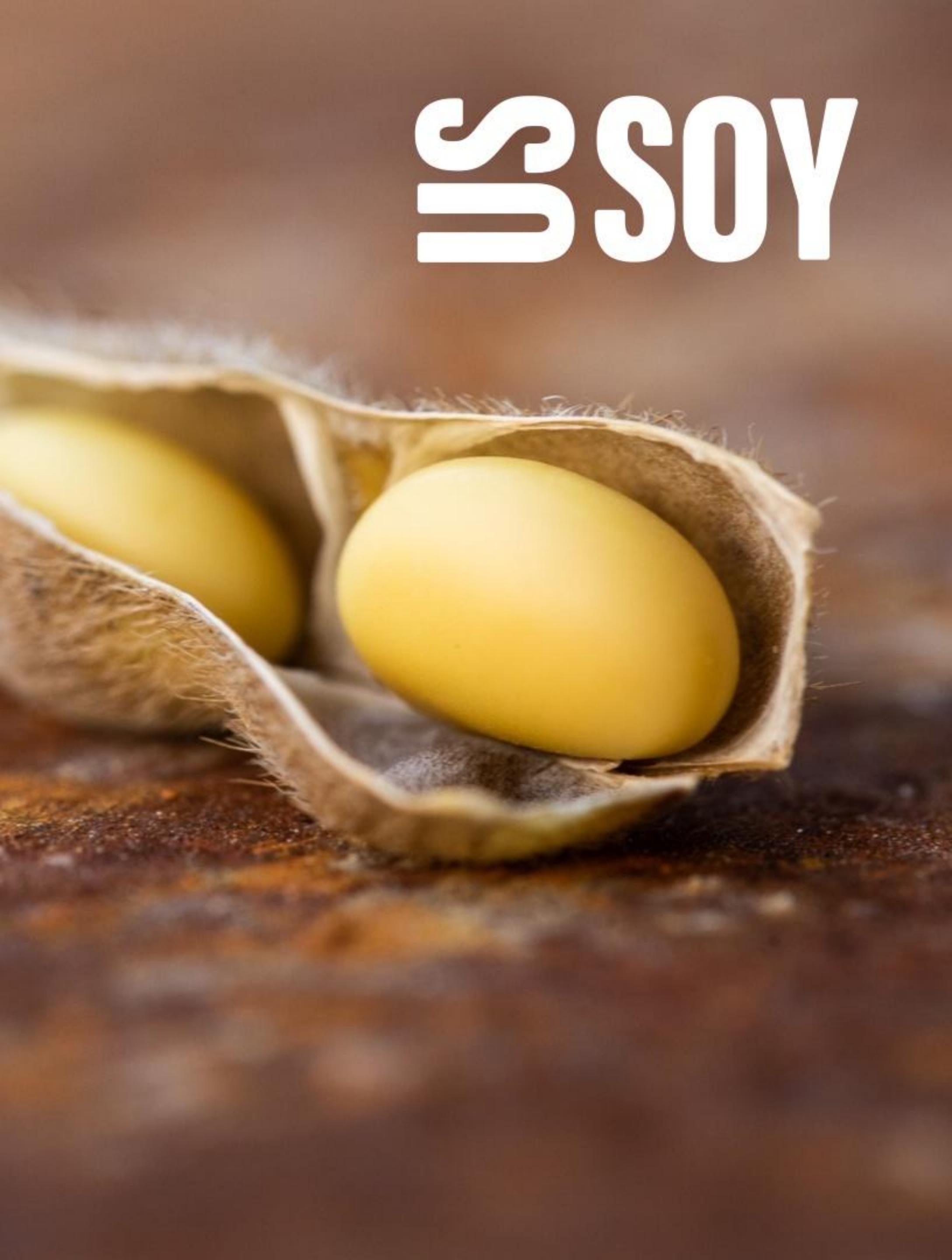
# What Evonik's Data Tells Us?

エヴォニックデータが  
示すもの

Tokyo, Japan  
November, 2025

3SOY





# 3SOY



大豆の品質  
Bean  
Quality



大豆ミールの品質  
Soybean Meal  
Quality



地域差

Regional  
Differences

動物性タンパク質産業を  
支援する



Supporting The  
Animal Protein  
Industry

RUBROS	BASES %	TOLERANCIA DE RECIBO %	
Materias extrañas	1,0	3,0	Para valores superiores cada por ciento o fracciones de 3,0% a razón del 1,5%
Incluido Tierra	0,5	0,5	Para valores superiores por cada por ciento
Granos negros	---	1,0	
Granos quebrados y/o partidos	20,0	30,0	Para valores superiores por cada por ciento dentro de 25,0% y hasta el 30,0% fracción proporcional 0,75% por cada por ciento
Granos dañados (brotados, fermentados, ardidos, dañados por calor, podridos)	5,0	5,0	Para valores superiores
Incluido Granos quemados o "avería"	---	1,0	Para valores superiores por cada por ciento
Granos verdes	5,0	10,0	Para valores superiores por cada por ciento
Humedad	---	13,5	
Chamico	---	5 sem. / kg	

**Libre de insectos y/o arácnidos vivos**

ARBITRAJE: Para los rubros condición "revolcado en tierra", "olores comercialmente objetos" arbitraje con un descuento sobre el precio de CERO COMA CINCO POR CIENTO (0,5%) a

3. **QUALITY / CONDITION:** To be final at time and place of shipment per certificate(s) covering below, based on a general representative composite sample taken according to method Contracts method list and issued by a member superintendent of FOSFA. Cost and choice

**3.1. Laboratory analysis by a FOSFA Analyst Member:**

- Oil content ..... : Basis .....  
*Non-reciprocal allowance of 1% discount for each 1% deficiency, fractions in proportion*
- Moisture ..... : Maximum .....

**3.2. Grading by a Superintendent or Analyst Member of FOSFA registered at Brazilian M**

- Foreign matter ..... : Basis .....  
Maximum.....  
*Non-reciprocal allowance of 1% discount for each 1% deficiency, fractions in proportion*
- Damaged beans ..... : Basis .....  
Maximum .....

*Non-reciprocal allowance of 2% discount for each 1% deficiency, fractions in proportion*  
Of which:

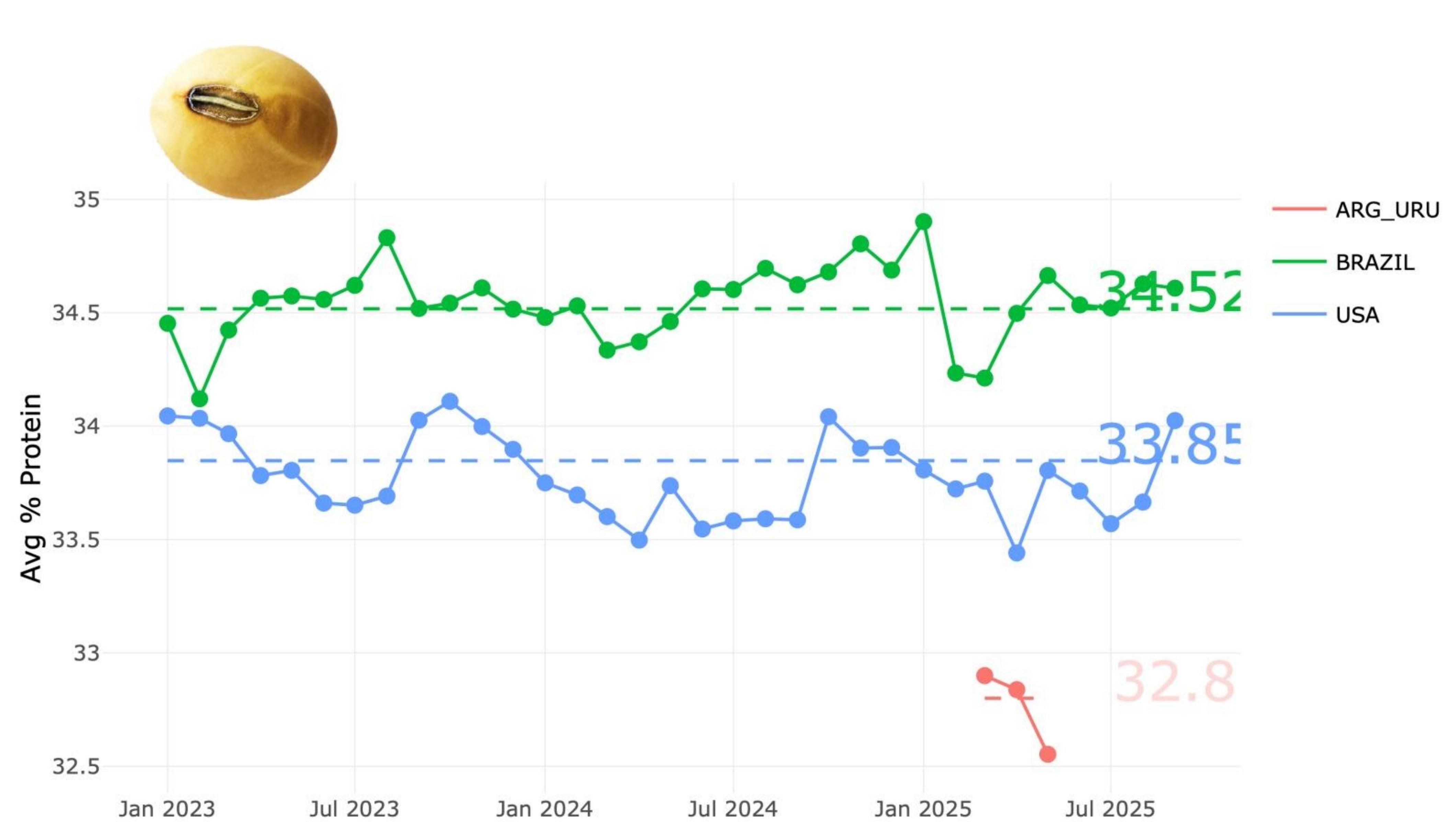
- Heat Damaged and Burned ..... : Maximum .....
- of which
  - Burned ..... : Maximum .....
  - Mouldy ..... : Maximum .....
- Broken beans ..... : Maximum .....
- Greenish beans ..... : Maximum .....
- Poisonous seeds/husks ..... : Substantially free within tolerances of:
  - 1 particle of treated vegetal seeds with unknown level of toxicity for each 1 metric tons loaded or part thereof.
  - 1 particle of toxic natural vegetal seeds for each 1 kg sample at each lot or part thereof.
- Castor Seed and/or Castor Seed Husks ..... : Maximum .....

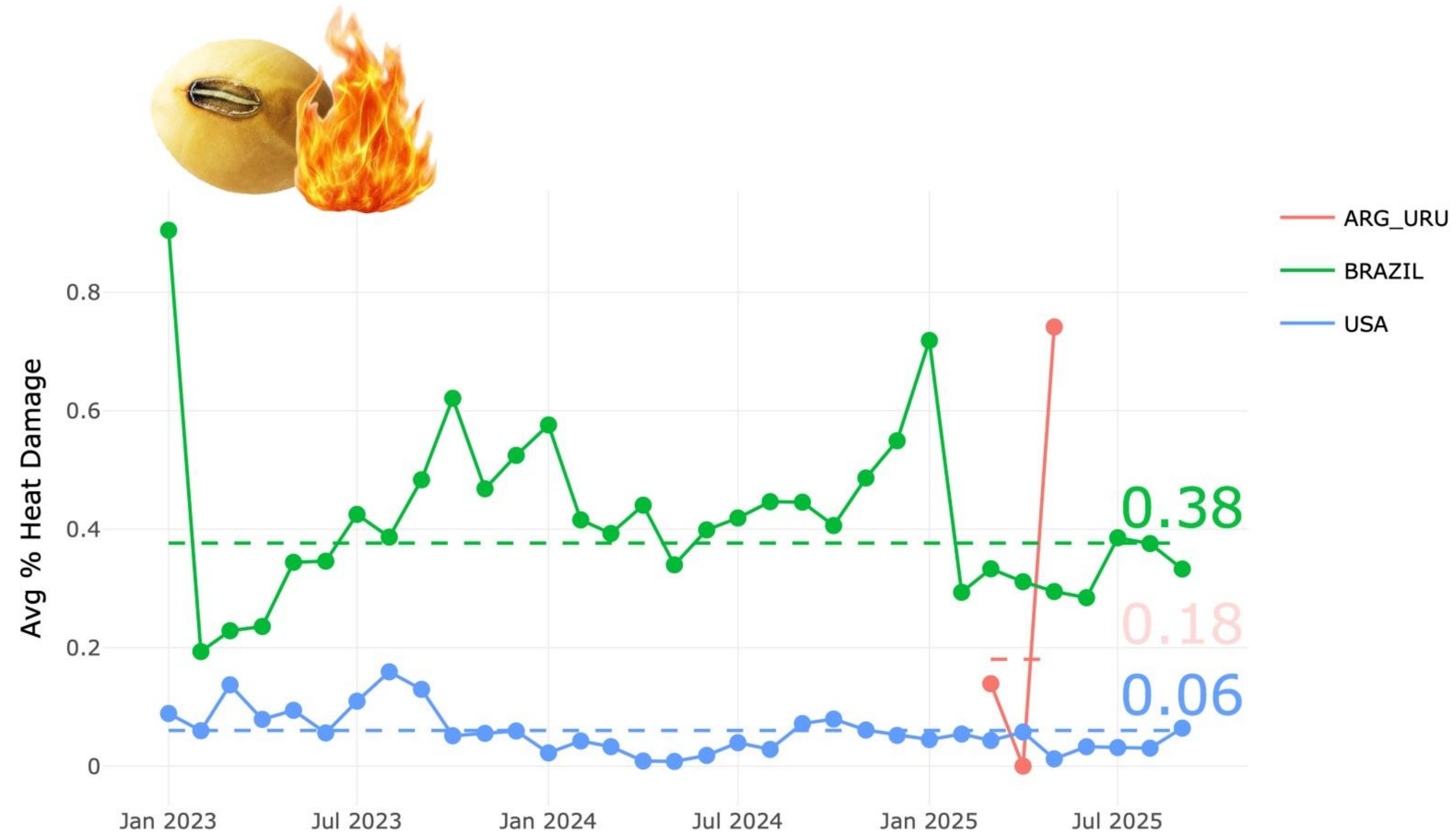
**TABLE 10.1 – GRADES AND GRADE REQUIREMENTS FOR SOYBEANS**

Grade	Maximum Limits of -			
	Damaged Kernels		Foreign Material (percent)	Splits (percent)
	Heat (part of total) (percent)	Total (percent)		
U.S. No. 1	0.2	2.0	1.0	10.0
U.S. No. 2	0.5	3.0	2.0	20.0
U.S. No. 3	1.0	5.0	3.0	30.0
U.S. No. 4	3.0	8.0	5.0	40.0

U.S. Sample Grade is soybeans that:

- a. Do not meet the requirements for grades U.S. No.1, 2, 3, or 4; or
- b. Contains 4 or more stones which have an aggregate weight in excess of 0.1 percent of the sample weight, 1 or more pieces of glass, 3 or more crotalaria seeds (*Crotalaria* spp.), 2 or more castor beans (*Ricinus communis* L.), 4 or more particles of an unknown foreign substance(s) or a commonly recognized harmful or toxic substance(s), 10 or more rodent pellets, bird droppings, or an equivalent quantity of other animal filth in 1,000 grams of soybeans, or
- c. Contain 11 or more animal filth, castor beans, crotalaria seeds, glass, stones, or unknown foreign substance(s) in any combination, or
- d. Have a musty, sour, or commercially objectionable foreign odor (except garlic odor); or
- e. Are heating or otherwise of distinctly low quality.





## Section 2. ミールの質

### Section 2. MEAL QUALITY

The standard of quality shall be the soybean meal of fair merchantable quality conforming to standard definitions and standard specifications of the Association, as set forth in these Trading Rules. Analysis shall be made in accordance with methods approved by the American Oil Chemists' Society (AOCS) in effect as of the date of the contract. [See Appendix A, Section 2]

## Section 3. ミール仕様

### Section 3. MEAL SPECIFICATIONS

品質基準は、本取引規則に定める協会標準定義及び標準仕様に適合する、公正な商品品質の大豆ミールとする。分析は契約締結日時点で有効なアメリカ油脂化学者協会(AOCS)承認方法に従い実施するものとする。

**All specifications can be modified based on agreements between buyer and seller.**

すべての仕様は、買い手と売り手の間の合意に基づいて変更可能です。

#### Soybean Meal (as defined above under Rule 2, Section1)

大豆ミール(ルール2, Section 1に定義されるもの)

Typical soybean meal product specifications are as follows:

典型的な大豆ミールの製品仕様は以下の通りです

Protein (Range)	44.0 – 49.0 %	プロテイン(範囲)
Fat	0.5 %	脂肪
Fiber (Maximum)	3.5 %	纖維(最大)
Moisture (Maximum)	12.0 %	水分(最大)

In accordance with industry practices and as allowed under the 2024 AAFCO Official Publication, soybean meal products may also contain the following:

業界慣行に従い、かつ2024年AAFCO公式出版物で認められている範囲において、大豆ミール製品には以下の成分も含まれる場合があります。

Flowability Agent (Maximum)	0.5% or 10 lbs per ton by weight of total product
Spent Bleach Clay (Maximum)	0.2% or 4 lbs per ton by weight of total product

流動性剤(最大)

総製品の重量あたり0.5%または10ポンド/トン

使用済みの漂白粘土(最大)

総製品の重量あたり0.2%または4ポンド/トン



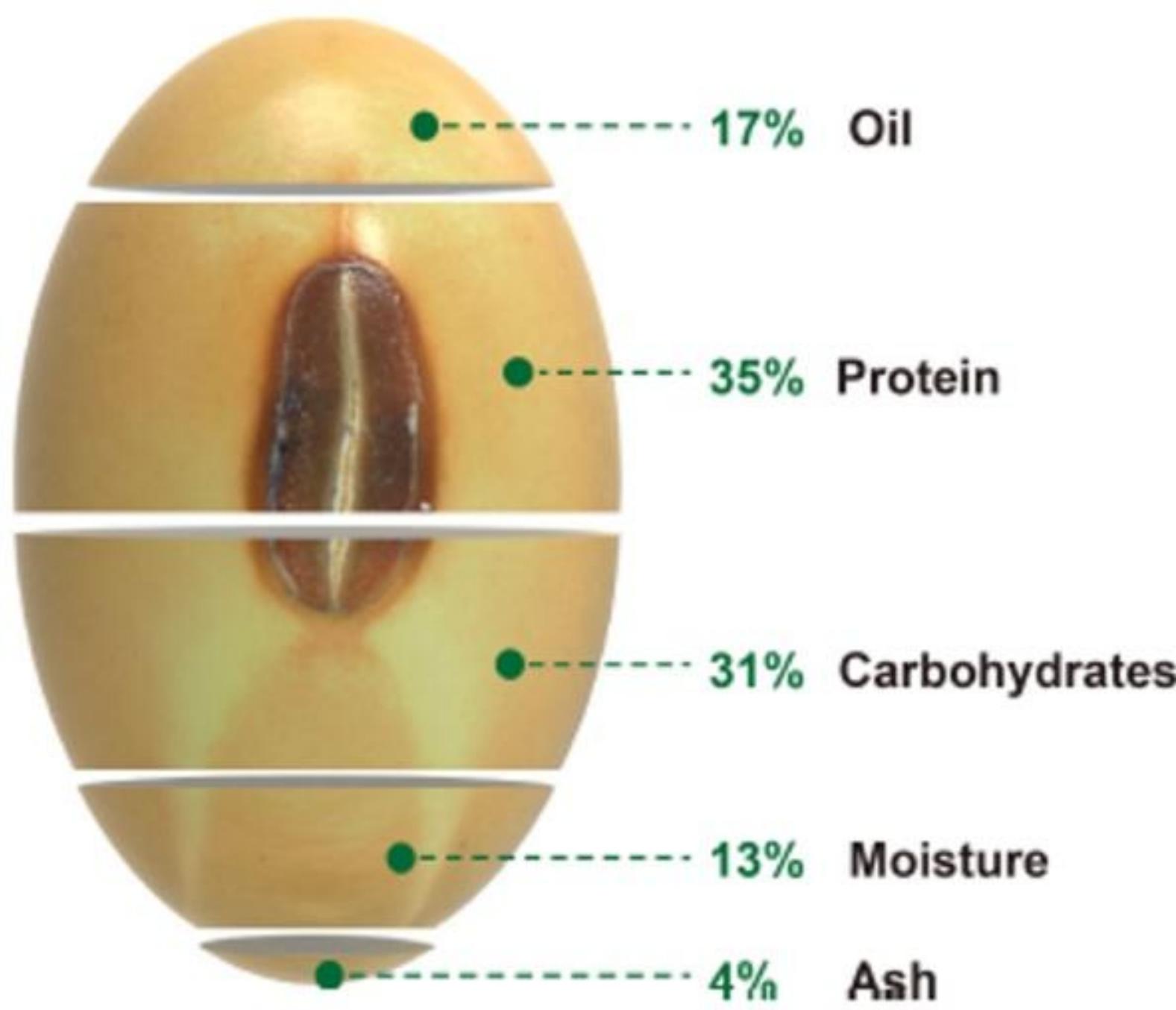
# What is protein?

## タンパクとは何か？





動物における必須アミノ酸(EAA)、非必須アミノ酸(NEAA)、および条件付き必須アミノ酸(CEAA)への分類  
 Classification of AA as EAA, NEAA, and CEAA in Animals<sup>a</sup>



Mammals <sup>b</sup>			Poultry			Fish		
EAA	NEAA	CEAA <sup>c</sup>	EAA	NEAA	CEAA <sup>c</sup>	EAA	NEAA	CEAA <sup>c</sup>
Arg	Ala	Gln	Arg	Ala	Gln	Arg	Ala	Gln
Cys	Asn	Glu	Cys	Asn	Glu	Cys	Asn	Glu
His	Asp	Gly	Gly	Asp	Tau	His	Asp	Gly
Ile	Ser	Pro	His	Ser		Ile	Ser	Tau
Leu		Tau	Ile			Leu		
Lys			Leu			Lys		
Met			Lys			Met		
Phe			Met			Phe		
Thr			Phe			Pro		
Trp			Pro			Thr		
Tyr			Thr			Trp		
Val			Trp			Tyr		
			Tyr			Val		
			Val					

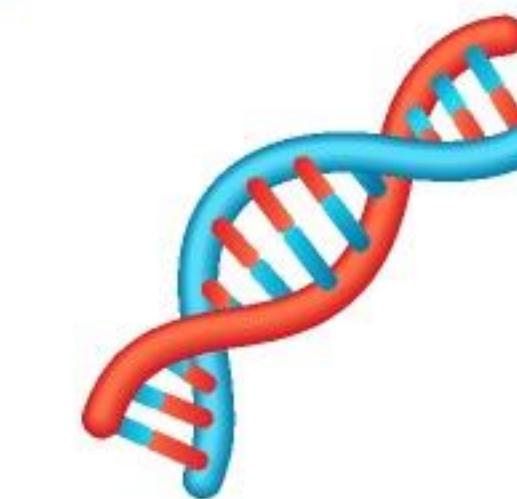
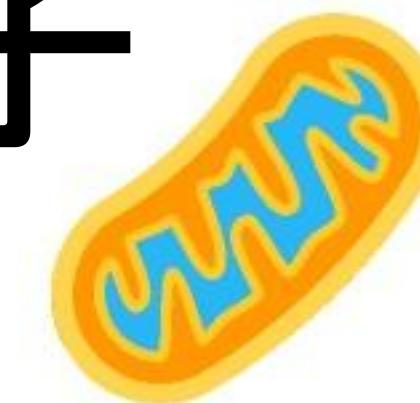
<sup>a</sup> Arginine, Alanine, Glutamine, Cysteine, Asparagine, Glutamate, Histidine, Aspartate, Glycine, Isoleucine, Serine, Proline, Threonine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tyrosine, Valine, Tryptophan, Tyrosine, Valine

<sup>b</sup> Mammals include pig, cow, and sheep.

<sup>c</sup> CEAA: Cysteine, Methionine, Threonine, Tyrosine, Valine

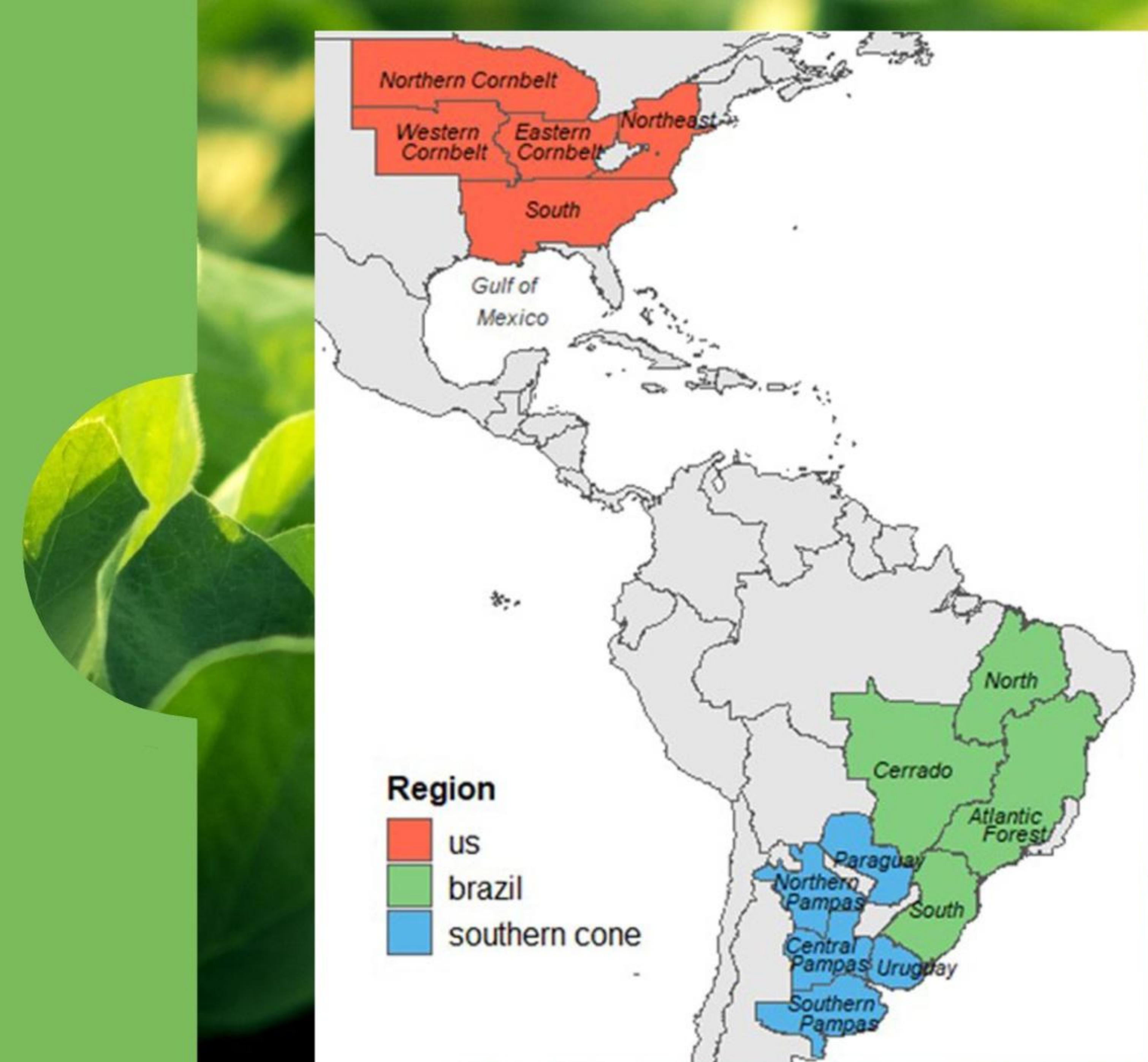
# Multifunctional Molecules

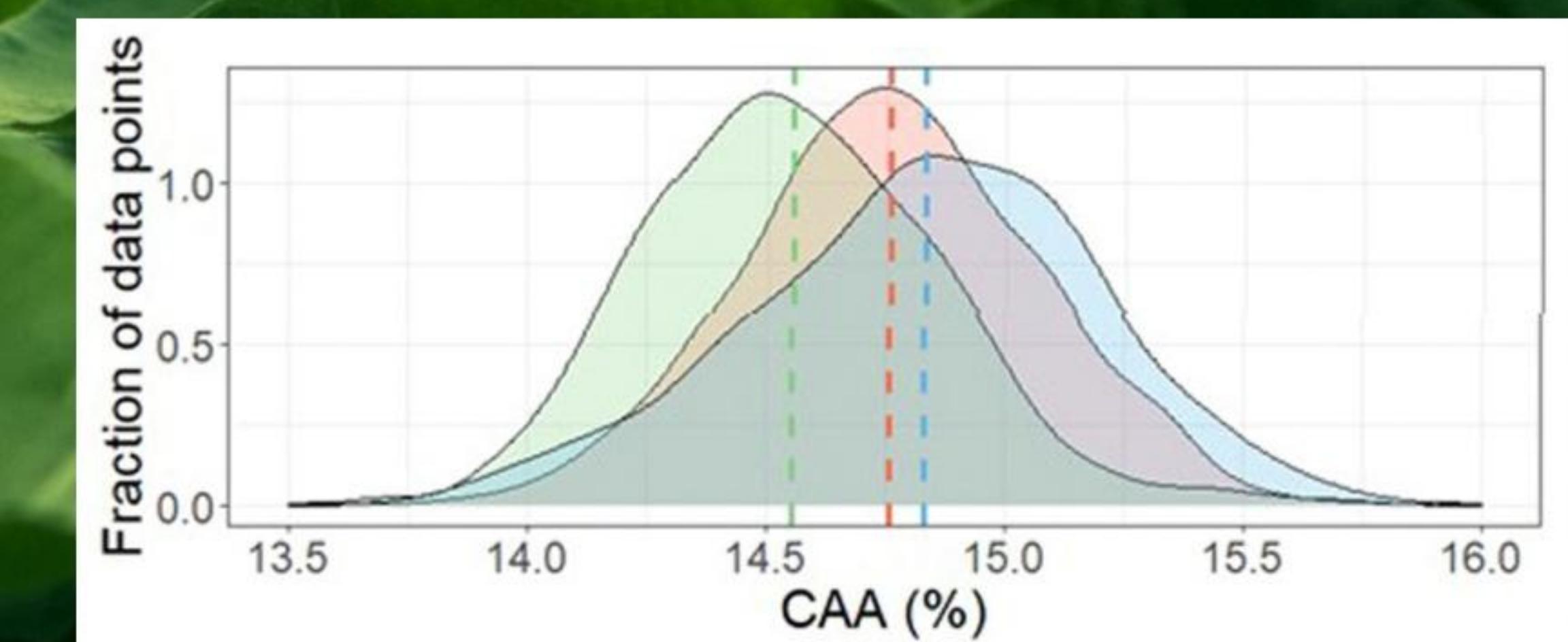
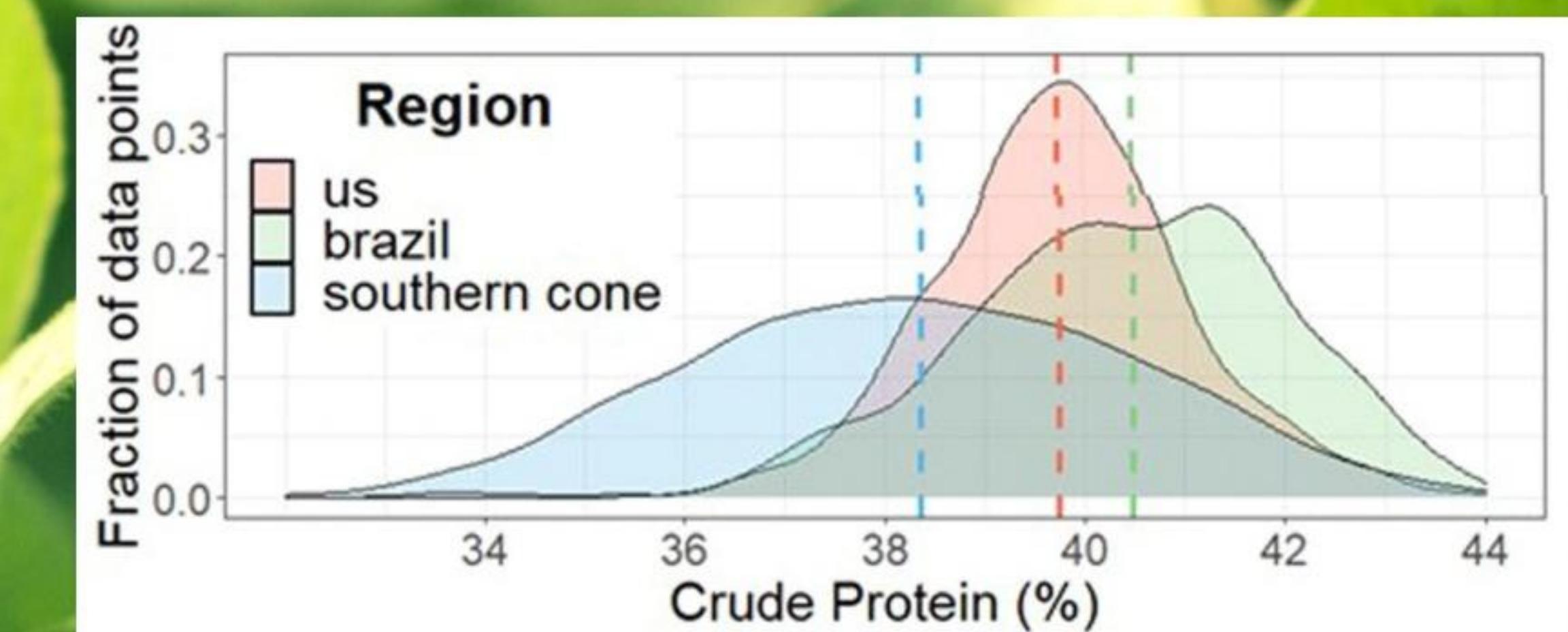
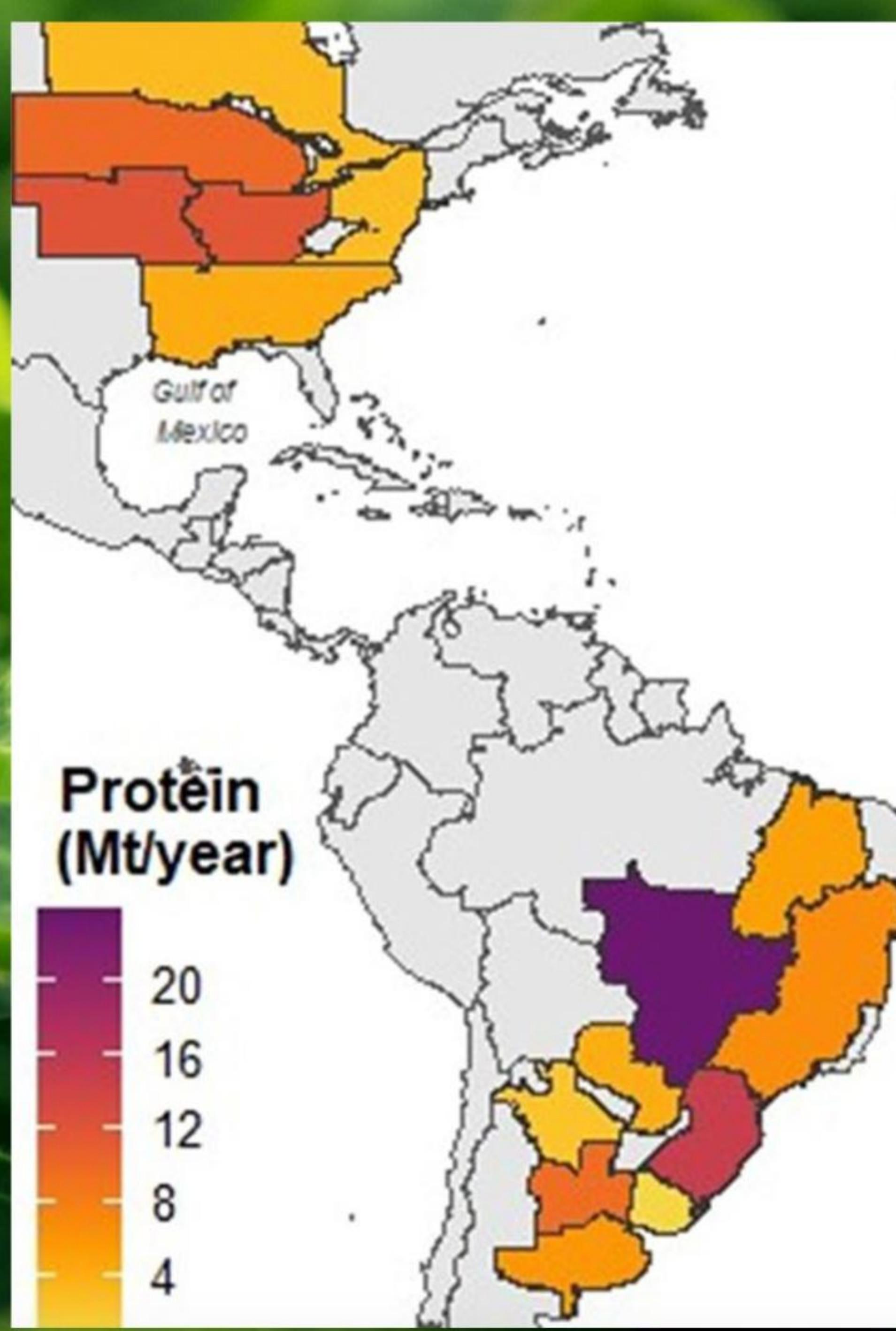
## 多機能分子

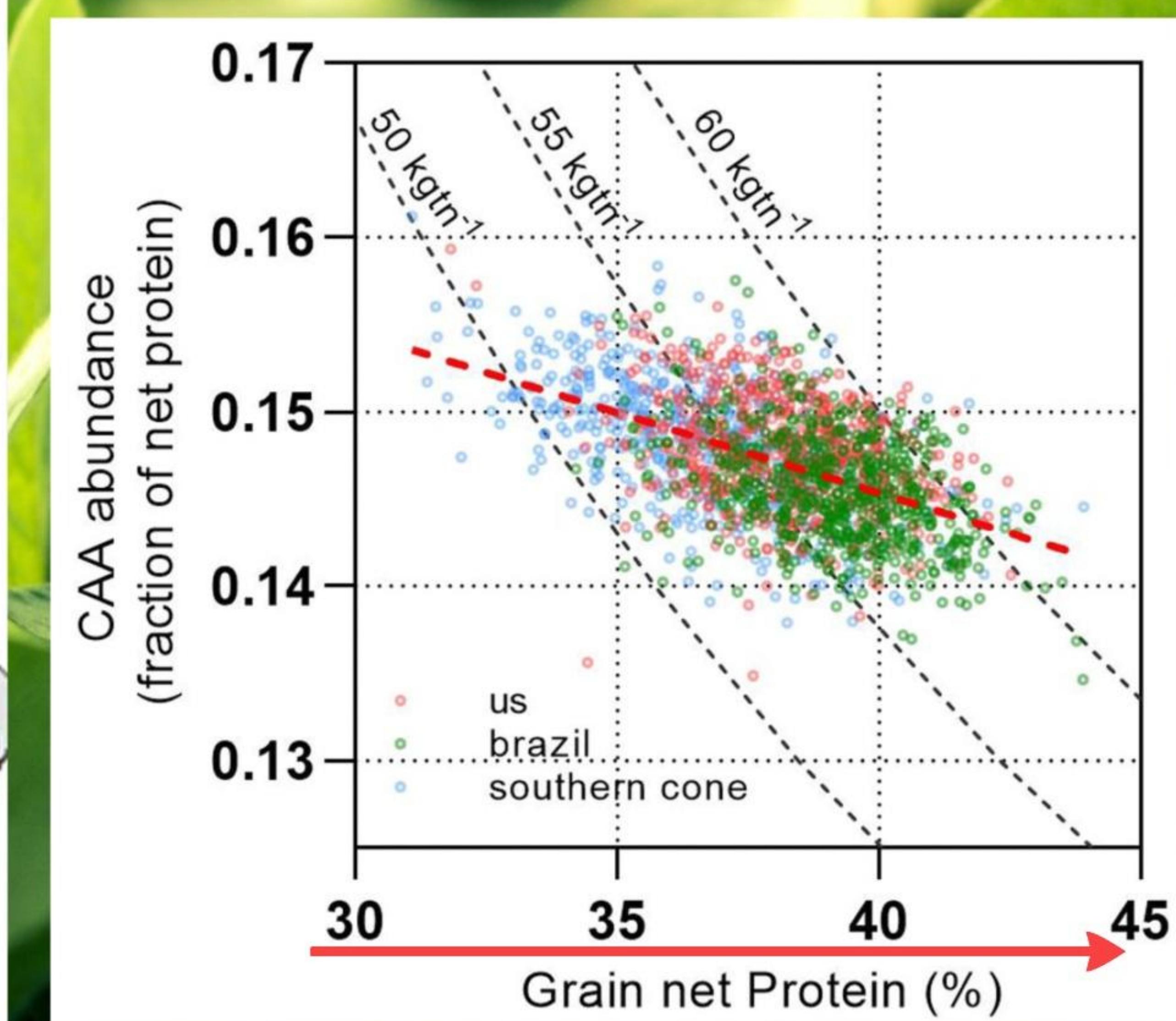
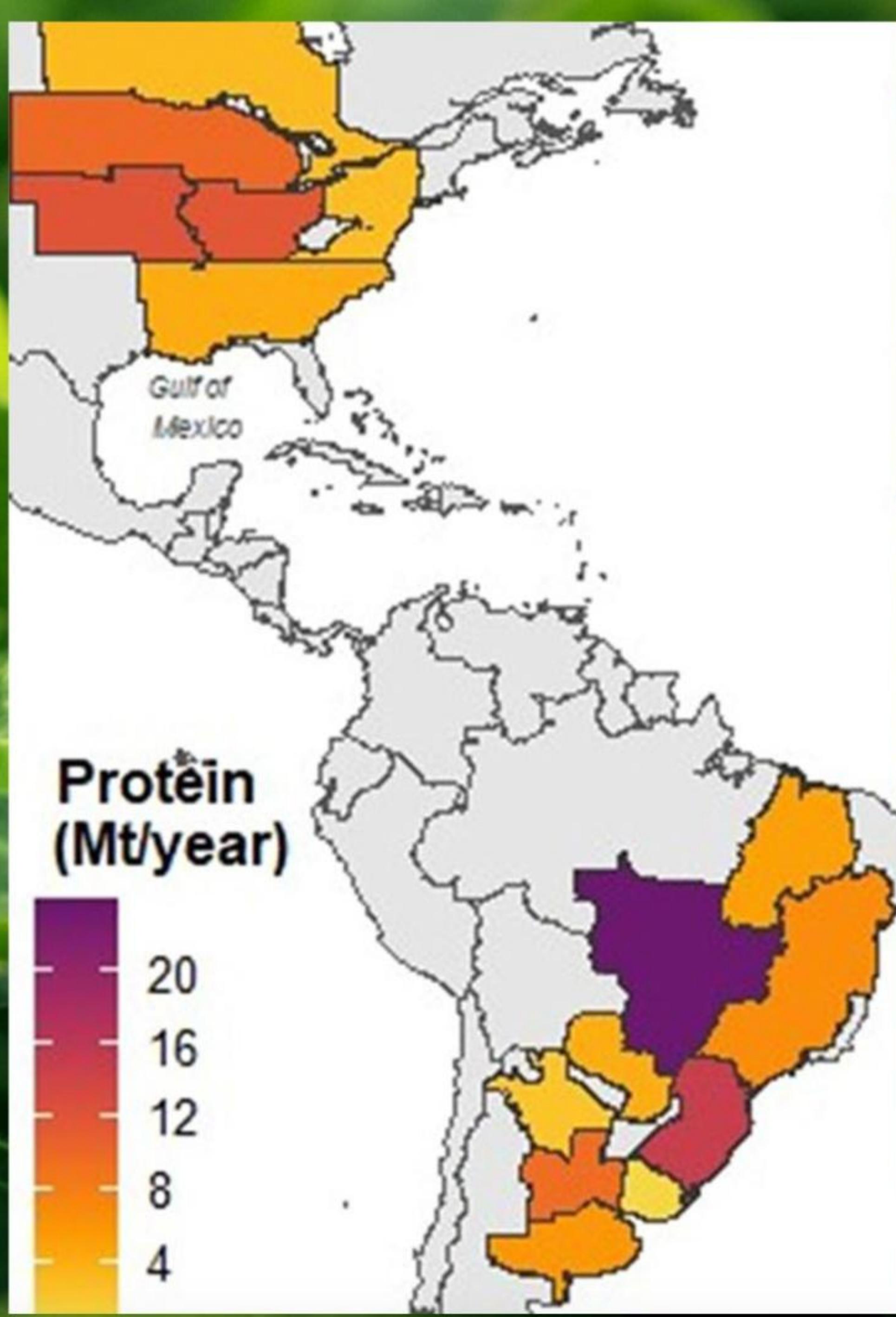


# Origins

产地

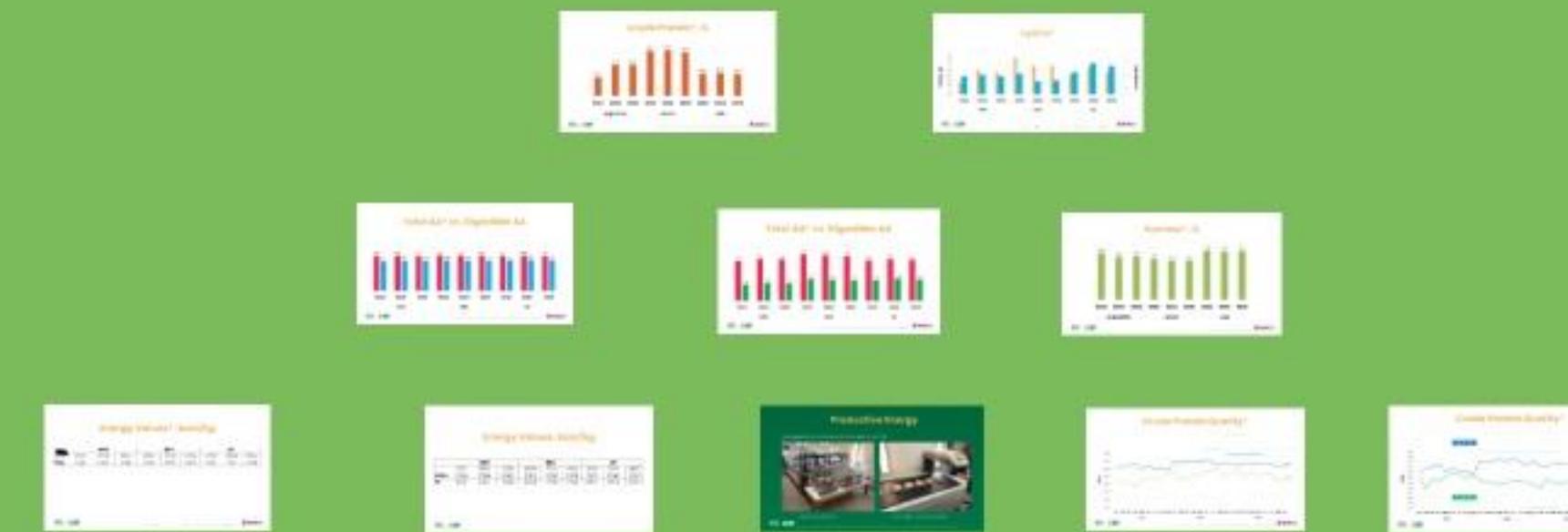






# United States Soybean Meal Quality Differentiators

アメリカ産大豆ミールの品質差別化要因

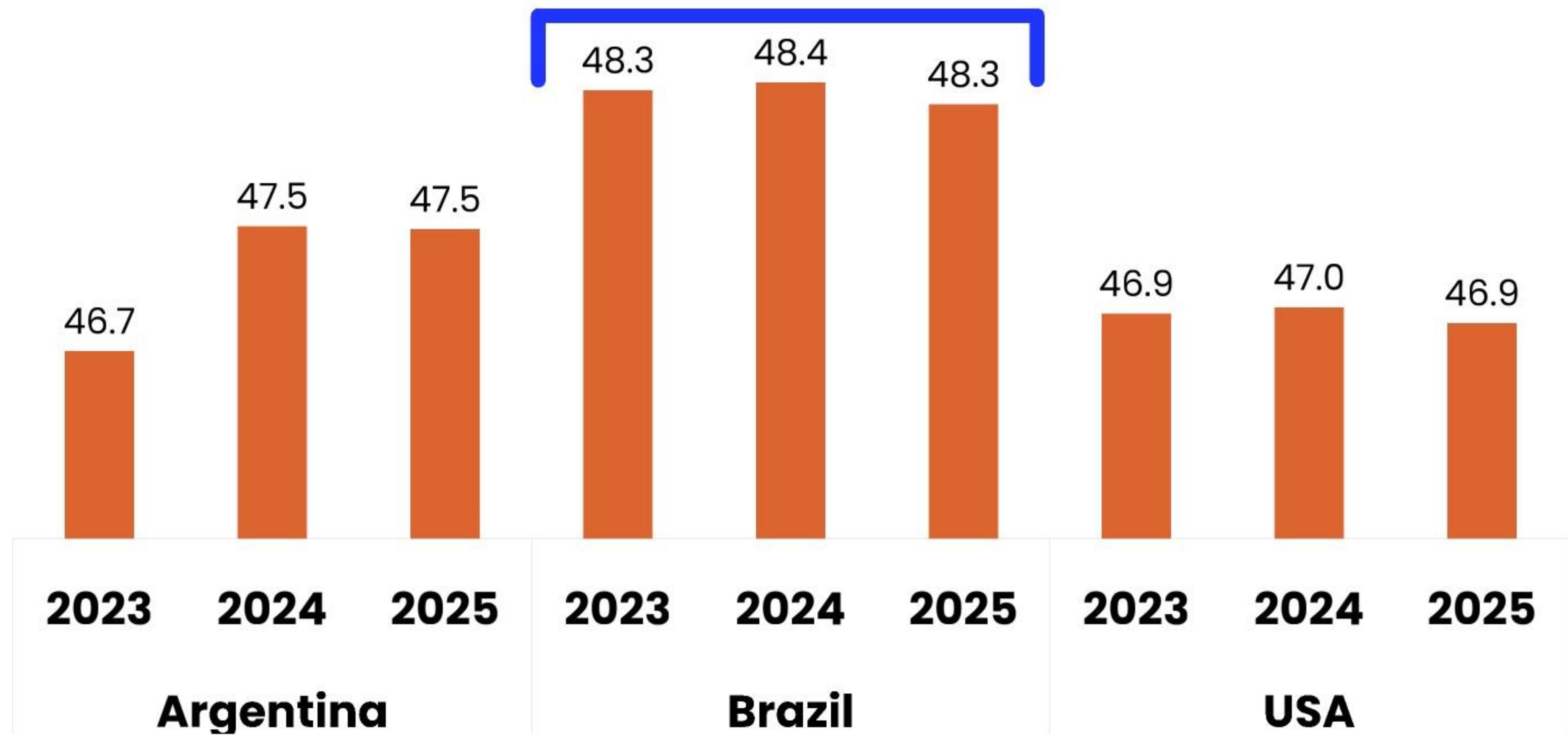


Harvest and storage. 収穫と貯蔵  
Consistency (post-harvest and processing). 一貫性(収穫後および加工)  
Amino acids profile. アミノ酸プロファイル  
Energy content. エネルギー含有量



# Crude Protein\*, %

## 粗タンパク



# Crude Protein\*, %

## 粗タンパク

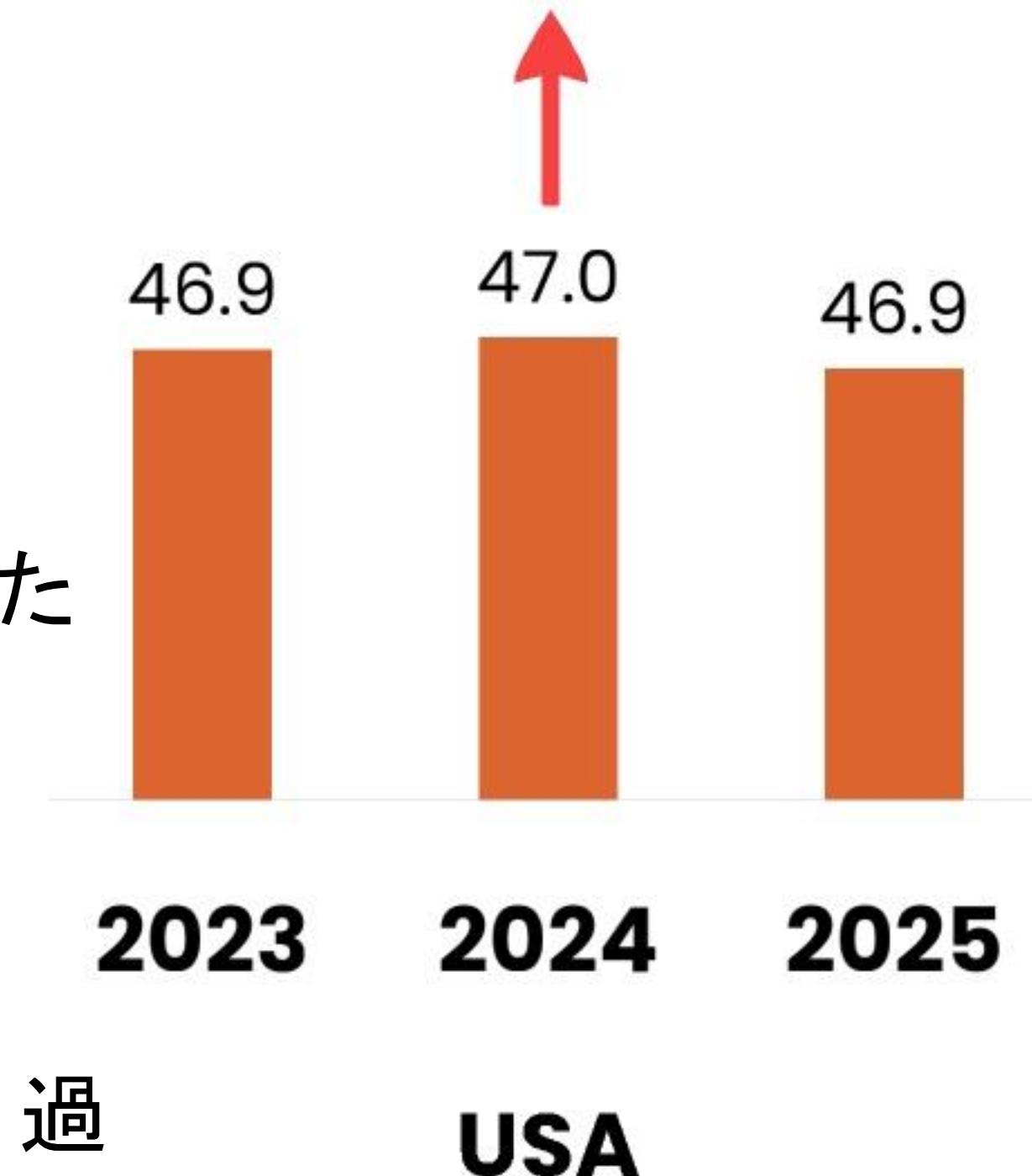


The average protein level of the 2024 crop was 34.0%.

2024年産作物の平均タンパク含有率は34.0%であった

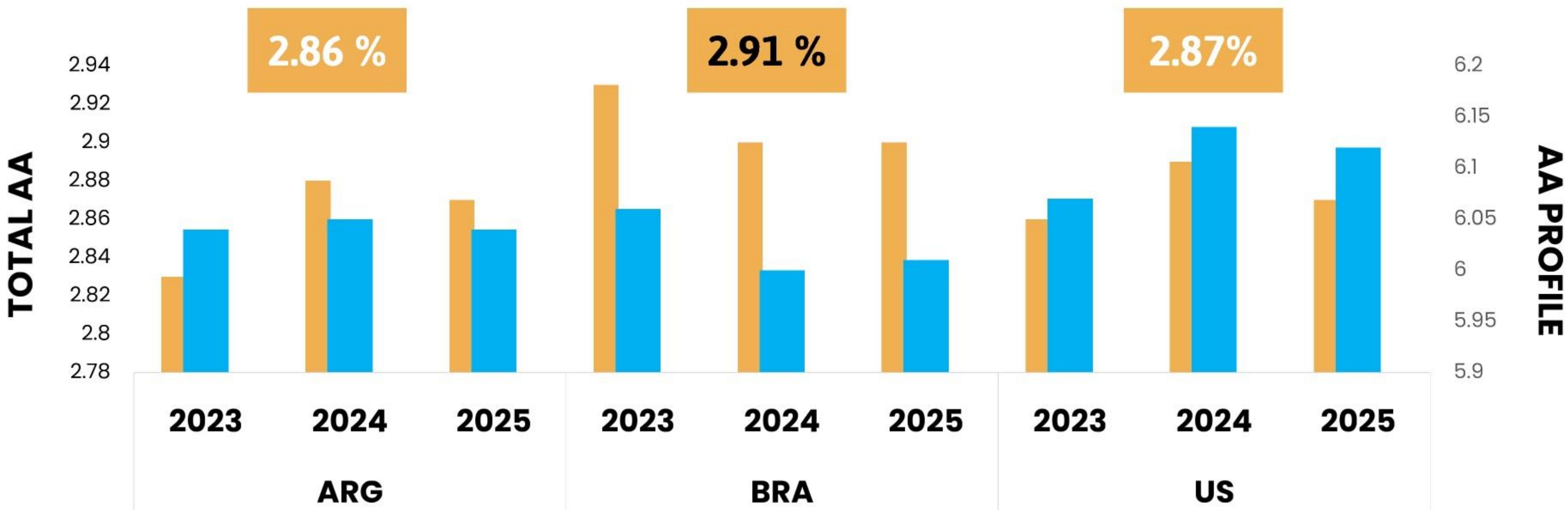
The highest average protein level since 2019, and similar to the average of the previous ten years.

2019年以降で最も高い平均タンパク質レベルであり、過去10年間の平均値と同程度である。



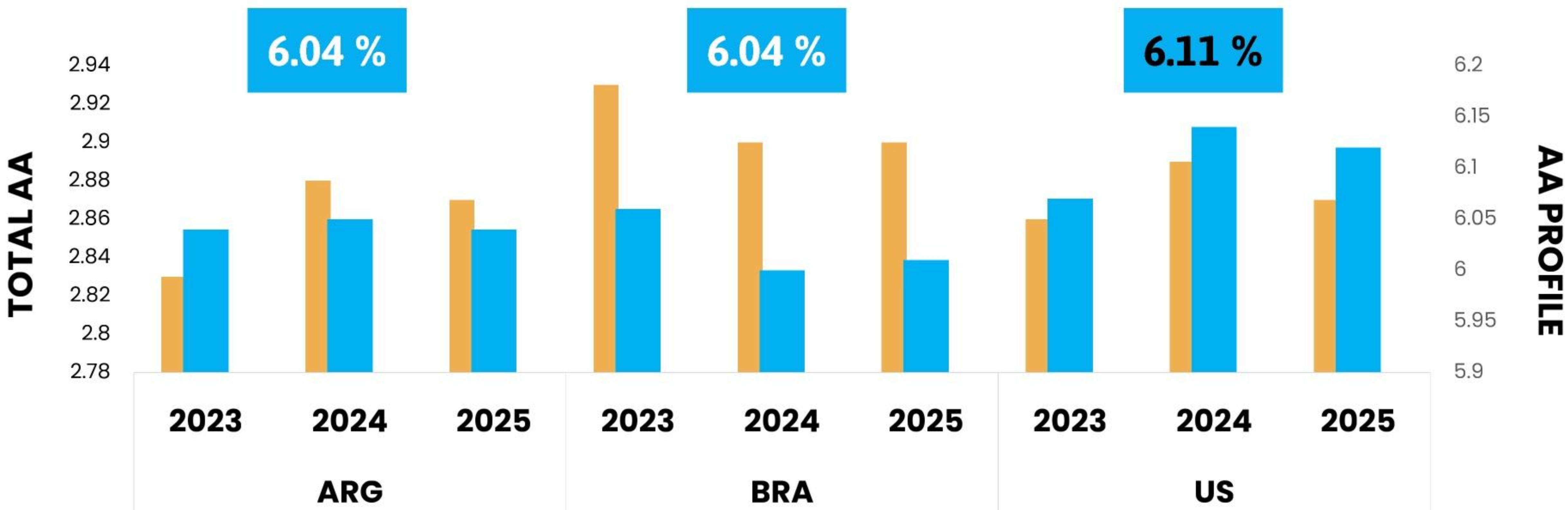
# Lysine\*

リジン



# Lysine\*

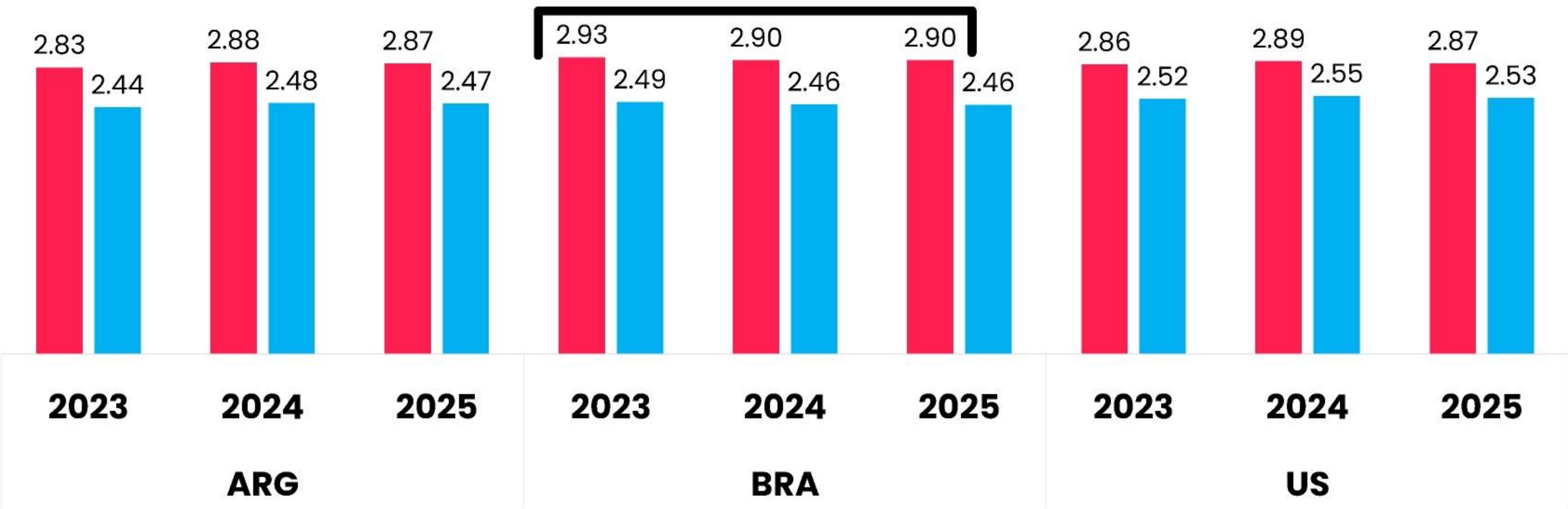
リジン



Lys

# Total AA\* vs. Digestible AA

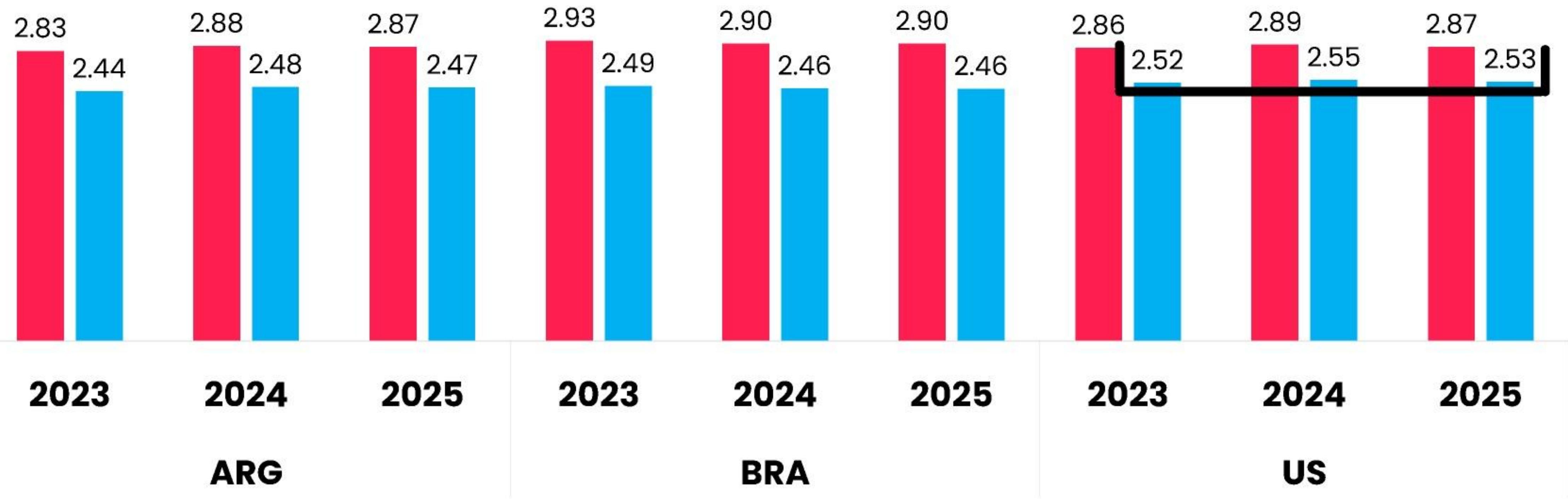
## 総アミノ酸 対 消化性アミノ酸



Lys

# Total AA\* vs. Digestible AA

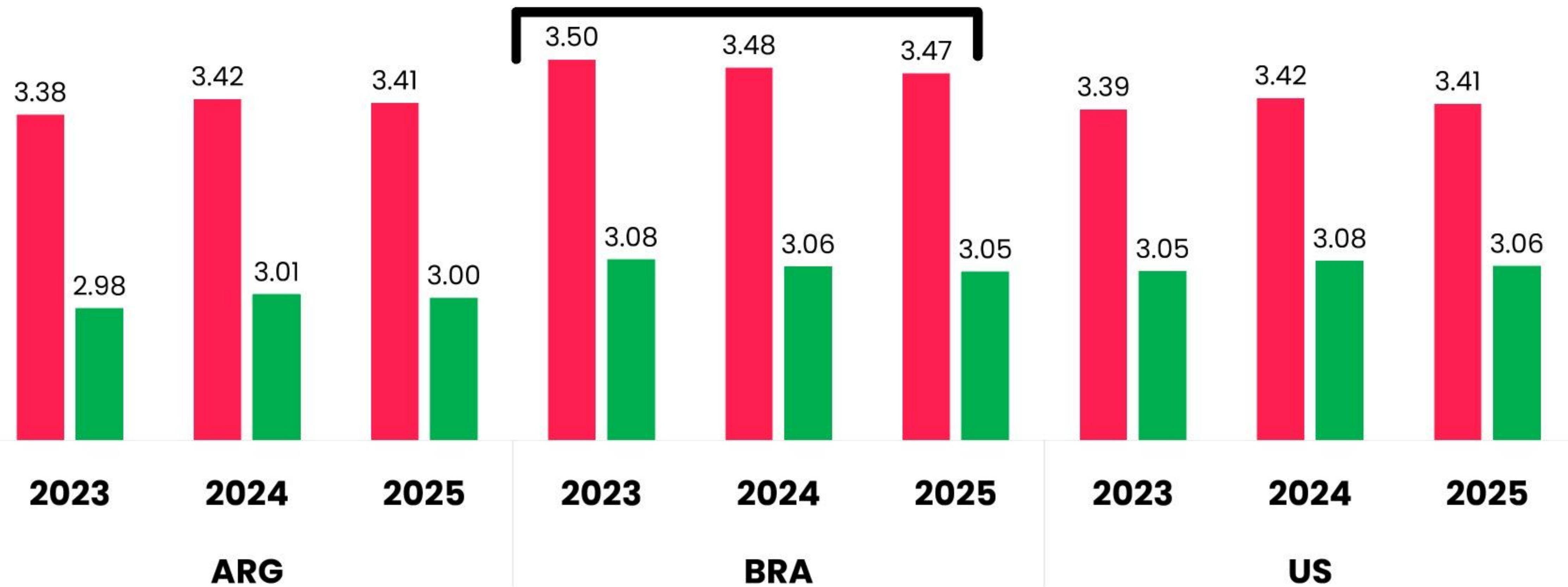
## 総アミノ酸 対 消化性アミノ酸



Arg

# Total AA\* vs. Digestible AA

総アミノ酸 対 消化性アミノ酸



Arg

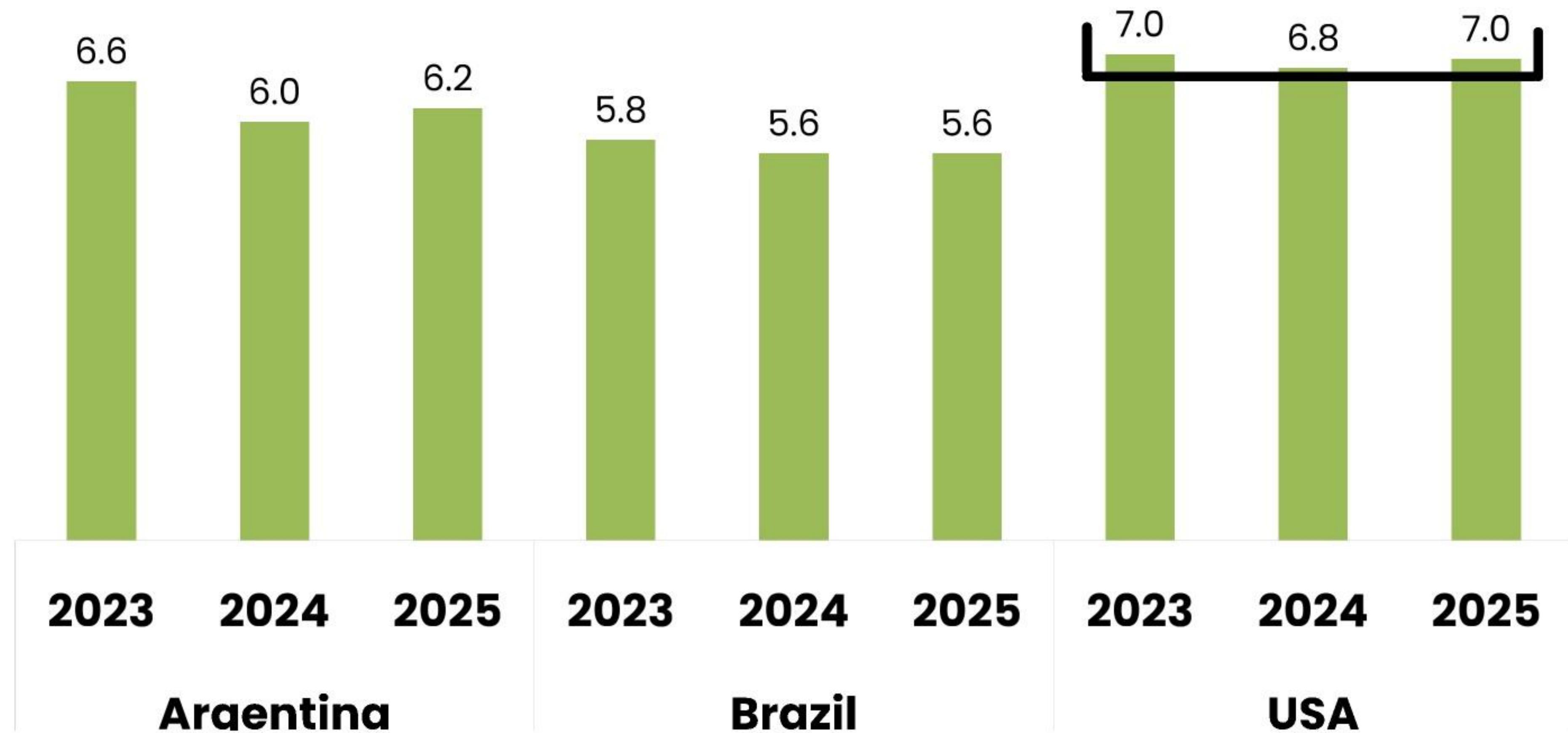
# Total AA\* vs. Digestible AA

総アミノ酸 対 消化性アミノ酸



# Sucrose\*, %

ショ糖



1グラムあたり≈3.9キロカロリー  
(kcal)のエネルギーを供給します

It contributes ≈3.9 kcal/g of energy  
(Stein et al., 2008).

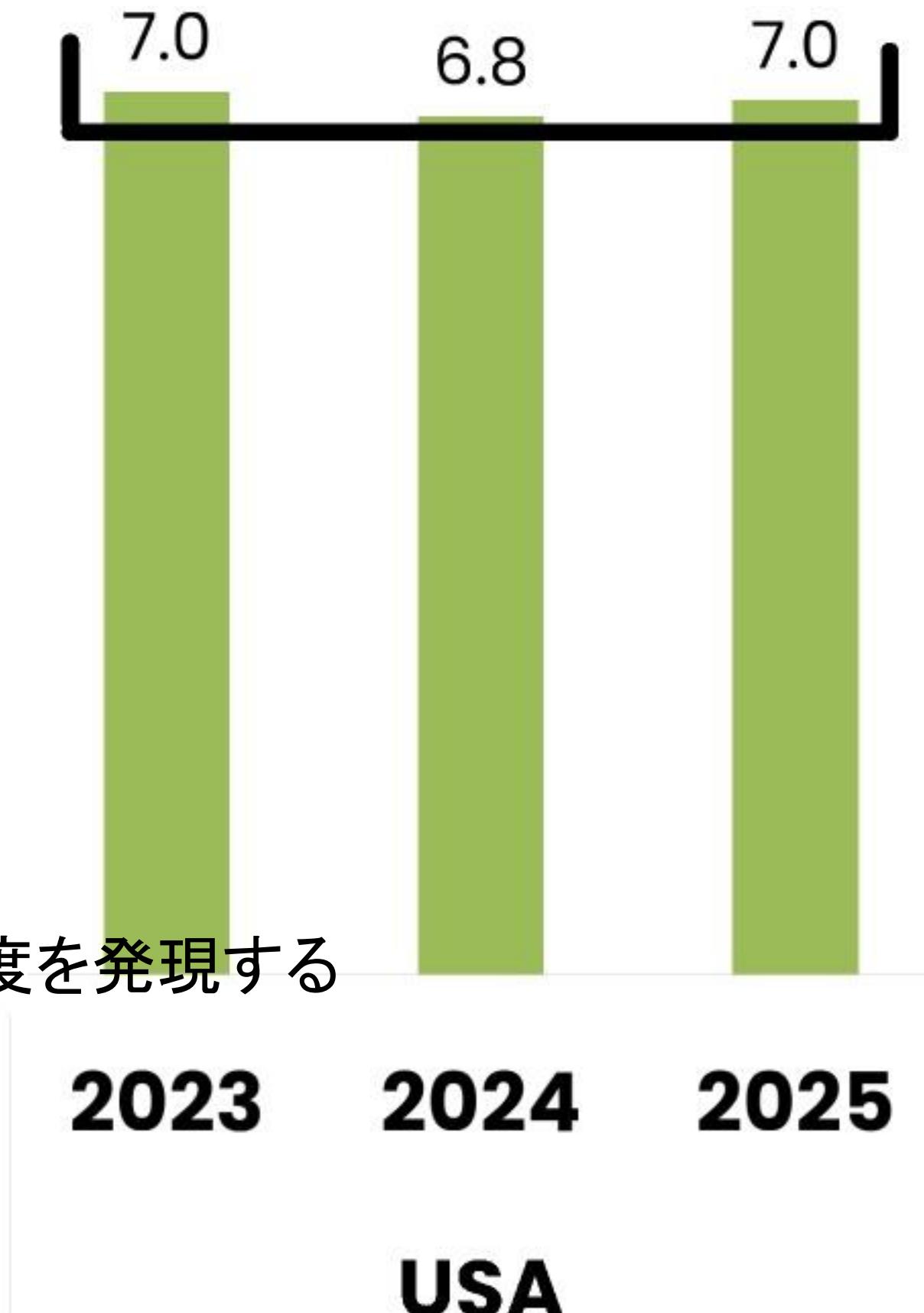


## Sucrose\*, % ショ糖

It shows some trade-offs with protein, expressing higher concentrations where protein is lower.

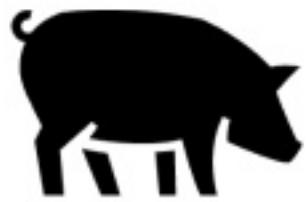
タンパクとのトレードオフを示しており、タンパク質濃度が低い領域でより高い濃度を発現する  
Average U.S. sucrose levels, at 4.3% in 2024 were lower than those in 2023 (5.4%)

2024年のアメリカの平均ショ糖含有量は4.3%で、2023年(5.4%)を下回った。



# Energy Values\*, kcal/kg

エネルギー値

	ARG			BRA			US		
	2023	2024	2025	2023	2024	2025	2023	2024	2025
<b>NEg</b>	2,146	2,182	2,154	2,156	2,165	2,150	2,187	2,181	2,198

	ARG			BRA			US		
	2023	2024	2025	2023	2024	2025	2023	2024	2025
<b>AMEn</b>	2,345	2,355	2,353	2,382	2,380	2,370	2,377	2,349	2,367

# Productive Energy

生産的エネルギー

Developed by the University of Arkansas since 2015. 2015年以降、アーカンソー大学によって開発された



Respiratory chambers

呼吸室



Dual energy x-ray absorptiometry

二重エネルギーX線吸収測定法

# Energy Values, kcal/kg

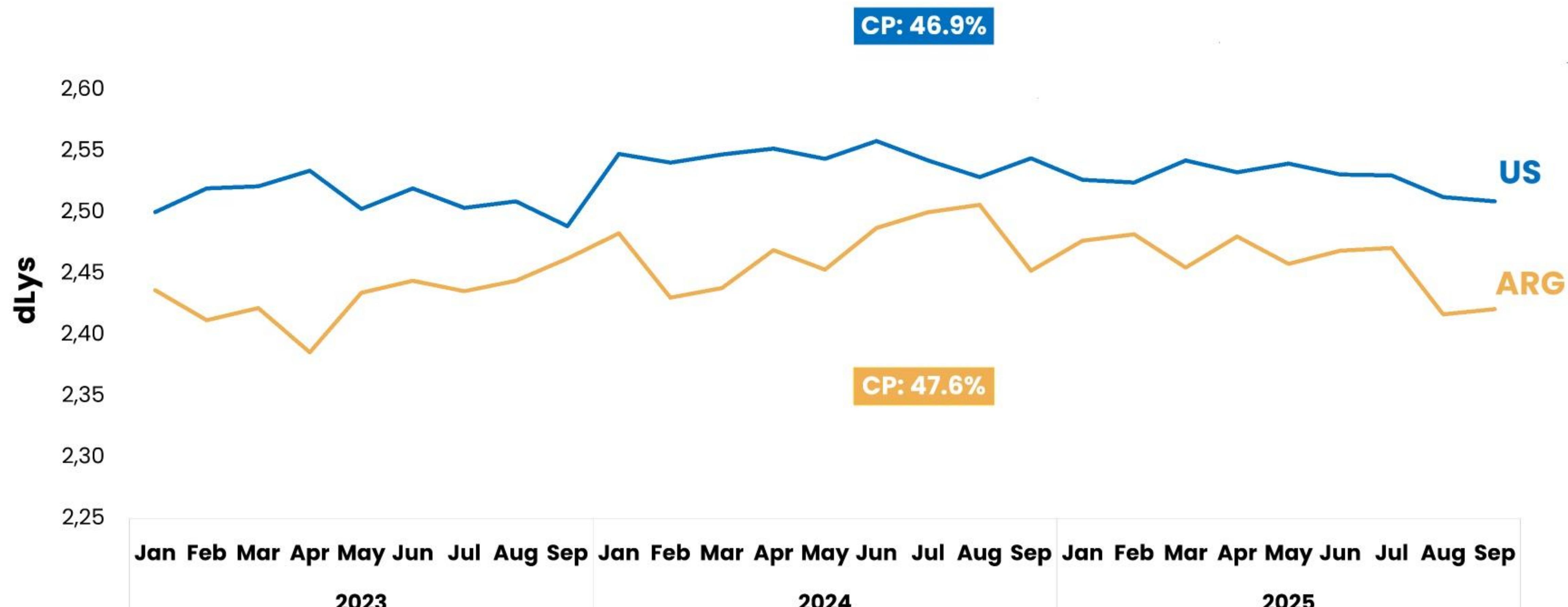
エネルギー値

	ARG			BRA			US		
	2023	2024	2025	2023	2024	2025	2023	2024	2025
<b>AMEn</b>	2,345	2,355	2,353	2,382	2,380	2,370	2,377	2,349	2,367
<b>PE</b>	3,108	3,155	3,148	3,250	3,248	3,235	3,254	3,252	3,252



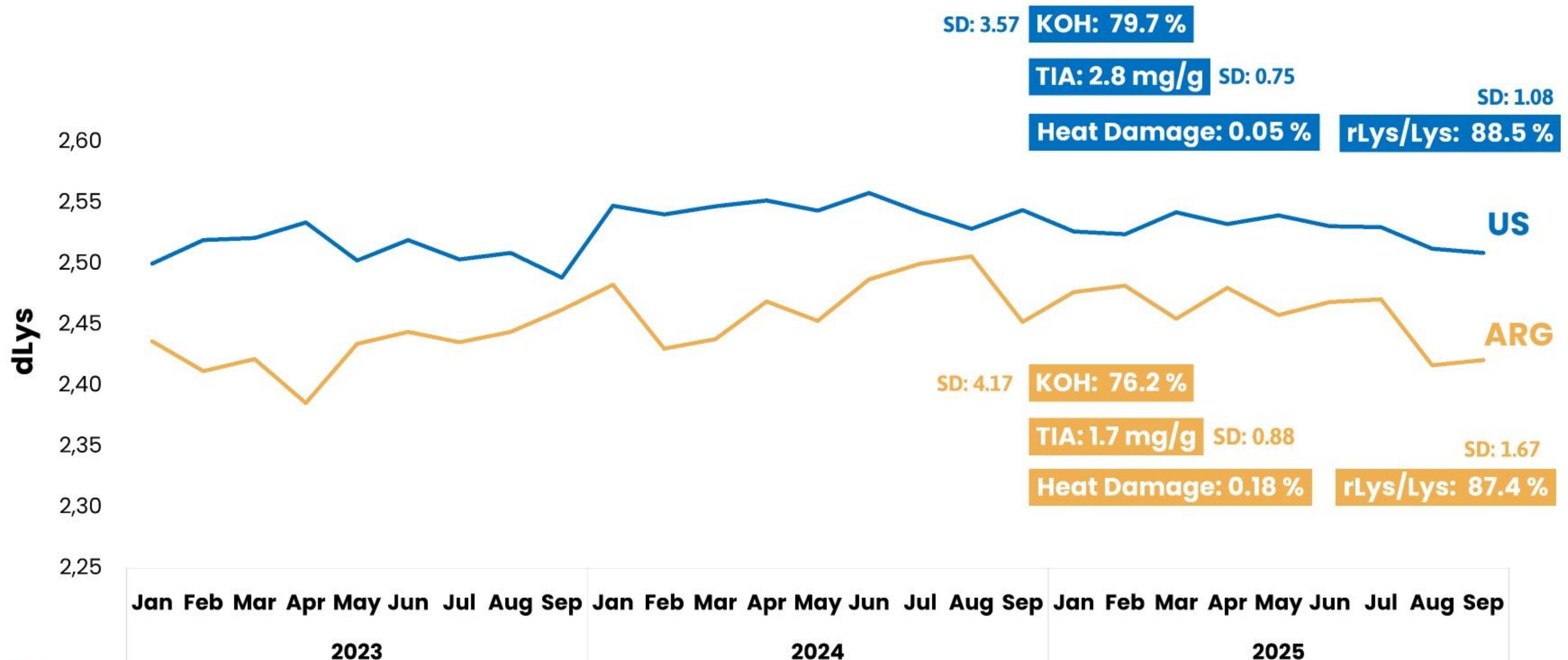
# Crude Protein Quality\*

## 粗タンパク品質



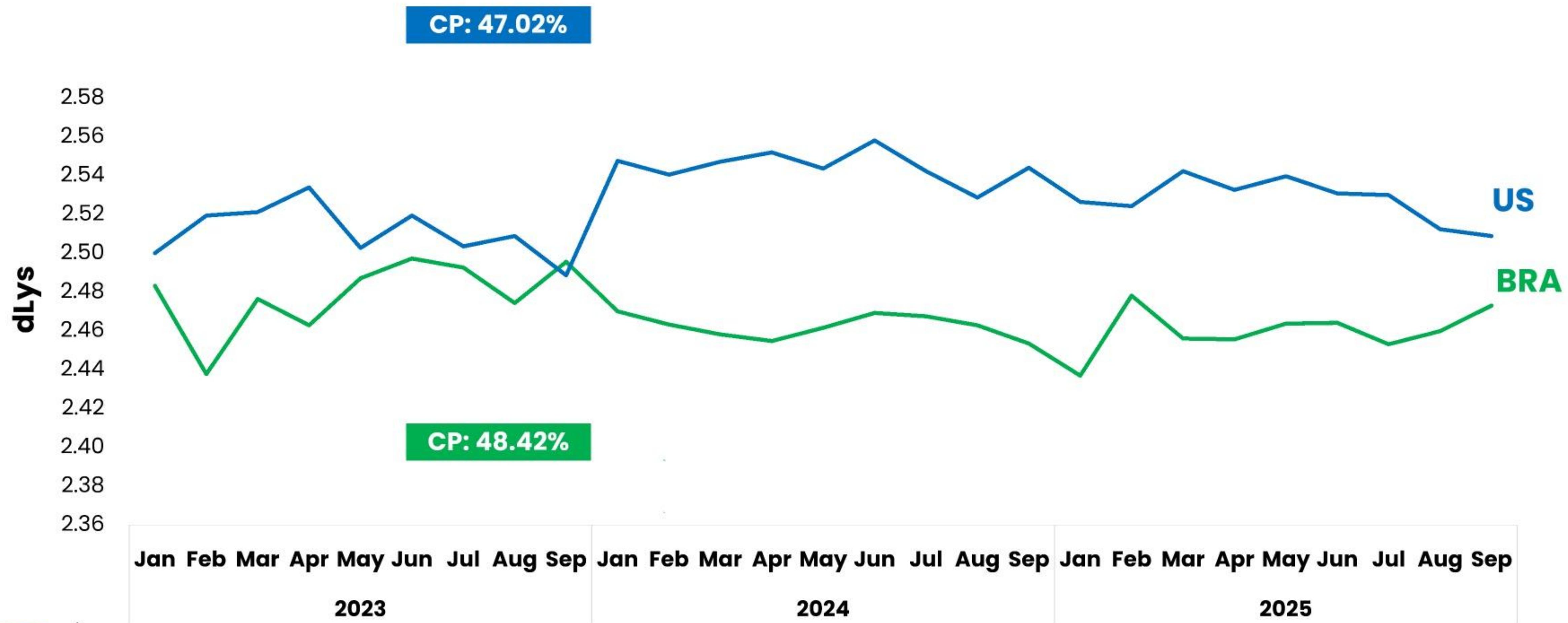
# Crude Protein Quality\*

粗タンパク品質



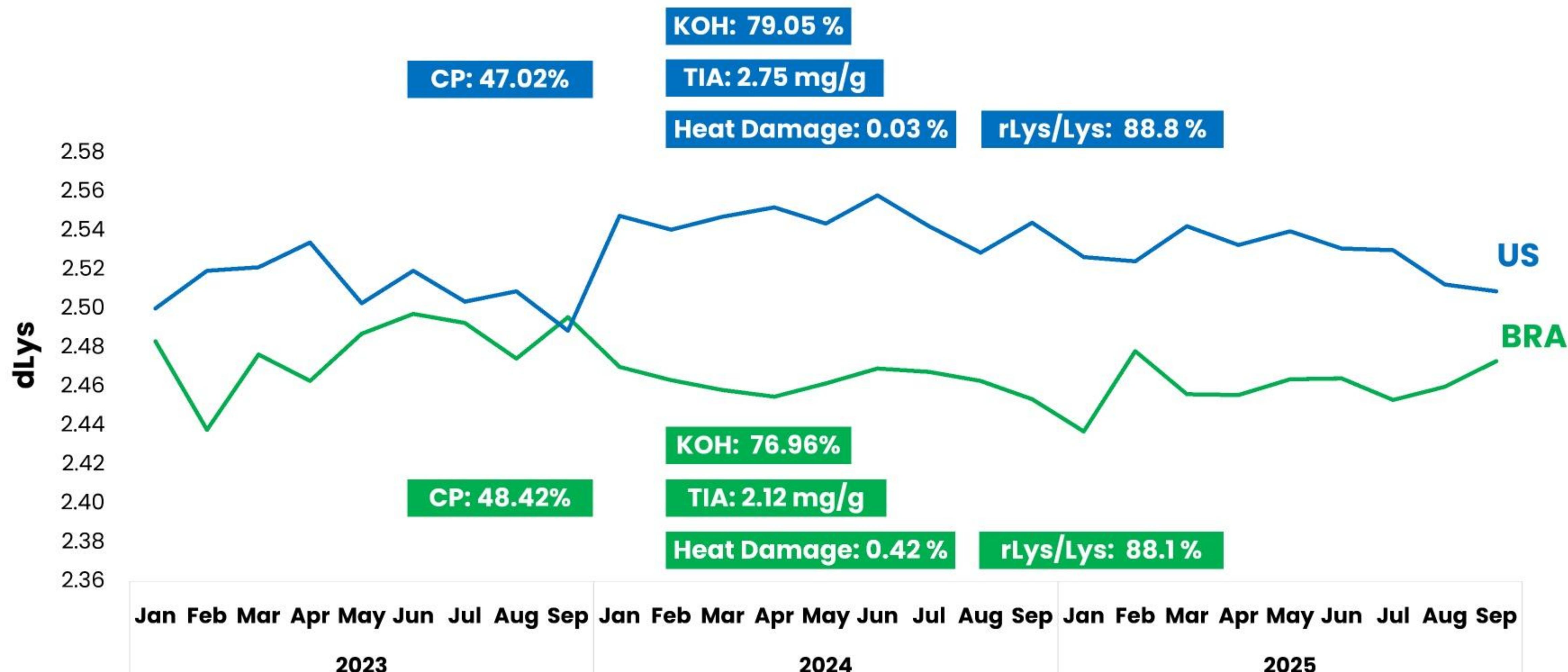
# Crude Protein Quality\*

粗タンパク品質



# Crude Protein Quality\*

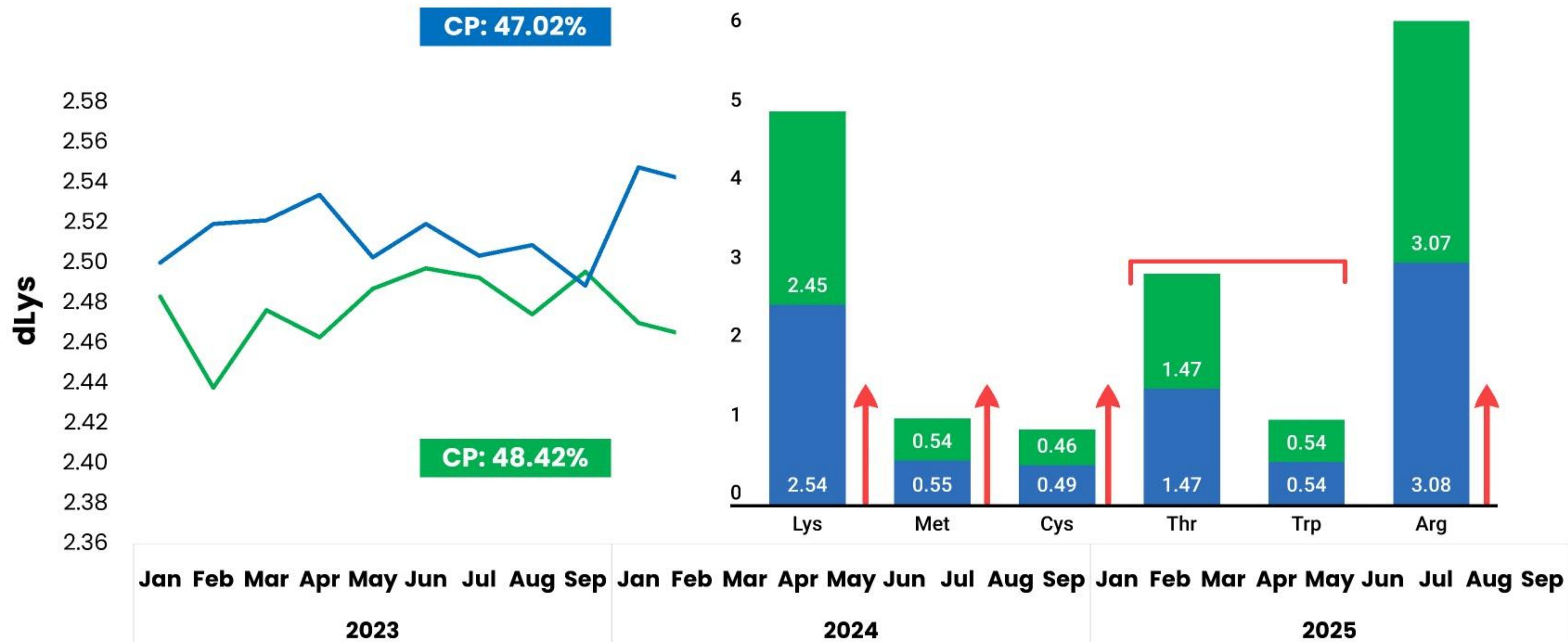
## 粗タンパク品質



# Crude Protein Quality\*

粗タンパク品質

US BRA





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Animal Utilization Lead - AMERICAS

