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Special Article: Wheat by Class Trade Estimation Methods

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The USDA wheat Interagency Commodity Estimate Committee (ICEC) is comprised of members of the USDA World Agricultural Outlook Board, Foreign Agricultural Service, Farm Service Agency, and the Economic Research Service (ERS). This committee is responsible for developing wheat production forecasts each month for major foreign producing countries, as well as, supply, demand, and price estimates for the United States. In addition to maintaining the all wheat supply and demand estimates that are presented in the wheat balance sheet published in the World Agricultural Supply and Demand Estimate (WASDE) monthly report, the committee also maintains separate balance sheets for each of five classes of wheat: Hard Red Winter (HRW), Hard Red Spring (HRS), Soft Red Winter (SRW), White wheat (WW), and Durum.

Data provided by USDA, National Agricultural Statistics Service (NASS) and the Census Bureau is not uniformly reported by class outside of durum, necessitating the development of methods to convert all wheat data into wheat by class data that is appropriate for inclusion in the associated balance sheets. In this feature, methods for estimating wheat by class imports and exports are summarized and examples given.

Converting Census Data to Grain-Equivalent Bushels

The monthly estimates of U.S. wheat exports and imports are each the sum of associated exports and imports of wheat grain, wheat flour, and selected wheat products. The flour and wheat products include both food and animal feed items. Before the flour and products can be aggregated with wheat grain, these items are converted to grain-equivalent bushels—that is, the quantity of wheat grain that would have to be milled to produce that quantity of flour or wheat

product (table 2). The Census Bureau trade data for grain, flour, and selected products are reported in metric tons (grain imports and exports) or kilograms (flour and products). Volume data for flour and selected products are converted to grain-equivalent kilograms—i.e., the quantity of wheat grain that would have to be milled to produce one kilogram of that flour or wheat product. Then, the grain and grain-equivalent data are converted to bushels. Please see table 2 for more details.

Table 2: Items and conversion factors used in estimating wheat trade

Categories and HTS codes*	Description	Unit	Grain Equivalent Factor	Pounds per Kilogram	Pounds per Bushel
Grain	All Wheat Grain and Seed Codes	kilogram	1	2.204622	60
Flour					
1101000010	Hard spring flour	kilogram	1.36986	2.204622	60
1101000020	Durum flour	kilogram	1.72414	2.204622	60
1101000030	White winter flour	kilogram	1.36986	2.204622	60
1101000060	Flour not elsewhere specified	kilogram	1.36986	2.204622	60
1101000050	Organic flour	kilogram	1.36986	2.204622	60
1103110020	Semolina	kilogram	1.72414	2.204622	60
1103110040	Wheat meal and groats	kilogram	1.01010	2.204622	60
Products					
1103200010	Wheat pellets	kilogram	1.92308	2.204622	60
1902112010	Pasta with eggs	kilogram	1.33200	2.204622	60
1902112020	Pasta with eggs	kilogram	1.33200	2.204622	60
1902112030	Pasta with eggs	kilogram	1.33200	2.204622	60
1902112090	Pasta with eggs	kilogram	1.33200	2.204622	60
1902114000	Pasta with eggs and sauce	kilogram	1.33200	2.204622	60
1902192010	Pasta without eggs	kilogram	1.42200	2.204622	60
1902192020	Pasta without eggs	kilogram	1.42200	2.204622	60
1902192030	Pasta without eggs	kilogram	1.42200	2.204622	60
1902192090	Pasta without eggs	kilogram	1.42200	2.204622	60
1902194000	Pasta without eggs, but with sauce	kilogram	1.42200	2.204622	60
1902400000	Couscous	kilogram	1.01010	2.204622	60
1904300000	Bulgur	kilogram	1.01010	2.204622	60

*HTS = Harmonized Tariff Schedule.

An example calculation converting 1.0 million kilograms of flour to grain-equivalent bushels is as follows:

Step 1. Converting kilograms of flour to grain-equivalent kilograms:

1,000,000 kilograms of flour × 1.36986 = 1,369,860 grain equivalent kilograms

Step 2. Converting grain-equivalent kilograms to grain-equivalent pounds:

1,369,860 kilograms × 2.204622 pounds/kilogram = 3,020,023.493 pounds

Step 3. Converting grain-equivalent pounds to grain-equivalent bushels:

3,020,023.493 pounds × 1 bushel/60 pounds = 50,334 bushels

Table 3: Wheat import trade codes, description, and weights by class		Wheat Class and Associated Weight				
HSCODE	Commodity Description	HRW	HRS	SRW	WHITE	DURUM
Wheat Grain						
1001100000	DURUM WHEAT	0	0	0	0	1
1001100010	DURUM WHEAT SEED FOR SOWING	0	0	0	0	1
1001100025	DURUM WHEAT, CERTIFIED ORGANIC, EXCEPT SEED	0	0	0	0	1
1001100061	DURUM WHEAT(GRADE 1) VITREOUS KRNL GT 84%, NOT ORGNIC, EXCPT SEED	0	0	0	0	1
1001100062	DURUM WHEAT(GRADE 1) VITREOUS KRNL NOT OVER 84%, NOT ORGNIC, EX SD	0	0	0	0	1
1001100065	DURUM WHEAT(GRADE 2) VITREOUS KRNL GT 84%, NOT ORGNIC, EXCPT SEED	0	0	0	0	1
1001100066	DURUM WHEAT(GRADE 2) VITREOUS KRNL NOT OVER 84%, NOT ORGNIC, EX SD	0	0	0	0	1
1001100069	DURUM WHEAT, OTHER THAN CERTIFIED ORGANIC, EXCEPT SEED, NESOI	0	0	0	0	1
1001100090	DURUM WHEAT, EXCEPT SEED	0	0	0	0	1
1001100091	DURUM WHEAT(GRADE 1) VITREOUS KERNEL > 84%	0	0	0	0	1
1001100092	DURUM WHEAT GRADE 1, VITREOUS KERNEL NOT OVER 84%	0	0	0	0	1
1001100095	DURUM WHEAT(GRADE 2) VITREOUS KERNEL > 84%	0	0	0	0	1
1001100096	DURUM WHEAT GRADE 2, VITREOUS KERNEL NOT OVER 84%	0	0	0	0	1
1001100099	DURUM WHEAT EXCEPT SEED, NESOI	0	0	0	0	1
1001110000	DURUM WHEAT SEED	0	0	0	0	1
1001190025	DURUM WHEAT, CERTIFIED ORGANIC, EXCEPT SEED	0	0	0	0	1
1001190051	DURUM WHEAT, GRADE 1, OTHER THAN SEED OR CERTIFIED ORGANIC	0	0	0	0	1
1001190053	DURUM WHEAT, GRADE 2, OTHER THAN SEED, OTHER THAN CERTIFIED ORGANIC	0	0	0	0	1
1001190061	DURUM WHEAT,#1,DARK HARD VITREOUS KRNL GT 84%, NOT CRT ORGNC, EX SD	0	0	0	0	1
1001190062	DURUM WHEAT,#1,DARK HARD VTRS KRNL NOT GT 84%, NOT CRT ORGNC, EX SD	0	0	0	0	1
1001190065	DURUM WHEAT,#2,DARK HARD VITREOUS KRNL GT 84%, NOT CRT ORGNC, EX SD	0	0	0	0	1
1001190066	DURUM WHEAT,#2,DARK HARD VTRS KRNL NOT GT 84%, NOT CRT ORGNC, EX SD	0	0	0	0	1
1001190069	DURUM WHEAT, OTHER THAN CERTIFIED ORGANIC, EXCEPT SEED, NESOI	0	0	0	0	1
1001901000	WHEAT AND MESLIN SEED FOR SOWING (EXCEPT DURUM)	0.25	0.5	0	0.25	
1001902000	WHEAT AND MESLIN, EXCEPT SEED, NESOI	0	1	0	0	0
1001902005	CANADIAN WESTERN XTRASTRONG HARD RED SPRING WHEAT	0	1	0	0	0
1001902010	RED SPRING WHEAT, GRADE 1 (EXCEPT SEED)	0	1	0	0	0
1001902011	RED SPRING WHEAT, GRADE 1, PROTEIN <= 12.9% BY WT.	0	1	0	0	0
1001902012	RED SPRNG WHET, GRAD 1 PROTEIN > 12.9%, <=13.3% WT	0	1	0	0	0
1001902013	RED SPRING WHEAT GRADE 1;PROTEIN >13.3%<=13.5% WGT	0	1	0	0	0
1001902014	RED SPRNG WHEAT GRADE 1 PROTEIN >13.6% <=13.9% WGT	0	1	0	0	0
1001902016	RED SPRING WHEAT GRADE 1 PROTEIN >13.9%<=14.2% WGT	0	1	0	0	0
1001902019	RED SPRING WHEAT GRADE 1 PROTEIN CONT >14.2% WGT.	0	1	0	0	0
1001902020	RED SPRING WHEAT, GRADE 2, (EXCEPT SEED)	0	1	0	0	0
1001902021	RED SPRING WHEAT GRADE 2 PROTEIN CONTENT<12.9% WGT	0	1	0	0	0
1001902022	RED SPRING WHEAT GRADE 2 PROTEIN >12.9%<=13.3% WGT	0	1	0	0	0
1001902023	RED SPRING WHEAT GRADE 2 PROTEIN >13.3%<=13.6% WGT	0	1	0	0	0
1001902024	RED SPRING WHEAT GRADE 2 PROTEIN >13.6%<=13.9% WGT	0	1	0	0	0
1001902026	RED SPRING WHEAT GRADE 2 PROTEIN >13.9%<=14.2% WGT	0	1	0	0	0
1001902029	RED SPRING WHEAT GRADE 2 PROTEIN CONT > 14.2% WGT.	0	1	0	0	0
1001902030	RED SPRING WHEAT, NESOI, (EXCEPT SEED)	0	1	0	0	0
1001902035	RED SPRING WHEAT, NESOI, (EXCEPT SEED)	0	1	0	0	0
1001902040	WHITE WINTER WHEAT, EXCEPT SEED	0	0	0	1	0
1001902050	CANADIAN WESTERN RED WINTER WHEAT, EXCEPT SEED	1	0	0	0	0
1001902060	SOFT WHITE SPRING WHEAT, EXCEPT SEED	0	0	0	1	0
1001902090	WHEAT AND MESLIN, EXCEPT SEED, NESOI	0	1	0	0	0
1001902095	WHEAT AND MESLIN, EXCEPT SEED, NESOI	0	1	0	0	0
1001902096	WHEAT AND MESLIN, EXCEPT SEED, NESOI	0	0	1	0	0
1001910000	WHEAT AND MESLIN SEED (EXCEPT DURUM)	0.25	0.5	0	0.25	0
1001990005	CANADIAN WESTERN EXTRA STRONG HARD RED SPRING (CWEA/HRS) WHEAT	0	1	0	0	0
1001990011	RED SPRING WHEAT,GRADE 1(EX SD), PROTEIN NOT GT 12.9% BY WGT	0	1	0	0	0

Continued on next page

Table 3: Wheat import trade codes, description, and weights by class, continued		Wheat Class and Associated Weight				
HSCODE	Commodity Description	HRW	HRW	HRW	HRW	HRW
1001990012	RED SPRING WHEAT,#1(EX SD),PROTEIN GT 12.9% BUT NOT GT 13.3% BY WGT	0	1	0	0	0
1001990013	RED SPRING WHEAT,#1(EX SD),PROTEIN GT 13.3% BUT NOT GT 13.6% BY WGT	0	1	0	0	0
1001990014	RED SPRING WHEAT,#1(EX SD),PROTEIN GT 13.6% BUT NOT GT 13.9% BY WGT	0	1	0	0	0
1001990015	RED SPRING WHEAT,#1(EX SD),PROTEIN GT 12.9% BUT NOT GT 13.9% BY WGT	0	1	0	0	0
1001990016	RED SPRING WHEAT,#1(EX SD),PROTEIN GT 13.9% BUT NOT GT 14.2% BY WGT	0	1	0	0	0
1001990019	RED SPRING WHEAT,GRADE 1(EX SD), PROTEIN GT 14.2% BY WGT	0	1	0	0	0
1001990020	RED SPRING WHEAT,GRADE 1(EX SD), PROTEIN GT 13.9% BY WGT	0	1	0	0	0
1001990021	RED SPRING WHEAT,GRADE 2(EX SD), PROTEIN NOT GT 12.9% BY WGT	0	1	0	0	0
1001990022	RED SPRING WHEAT,#2(EX SD),PROTEIN GT 12.9% BUT NOT GT 13.3% BY WGT	0	1	0	0	0
1001990023	RED SPRING WHEAT,#2(EX SD),PROTEIN GT 13.3% BUT NOT GT 13.6% BY WGT	0	1	0	0	0
1001990024	RED SPRING WHEAT,#2(EX SD),PROTEIN GT 13.6% BUT NOT GT 13.9% BY WGT	0	1	0	0	0
1001990025	RED SPRING WHEAT,#2(EX SD),PROTEIN GT 12.9% BUT NOT GT 13.9% BY WGT	0	1	0	0	0
1001990026	RED SPRING WHEAT,#2(EX SD),PROTEIN GT 13.9% BUT NOT GT 14.2% BY WGT	0	1	0	0	0
1001990028	RED SPRING WHEAT,GRADE 2(EX SD), PROTEIN GT 13.9% BY WGT	0	1	0	0	0
1001990029	RED SPRING WHEAT,GRADE 2(EX SD), PROTEIN GT 14.2% BY WGT	0	1	0	0	0
1001990035	RED SPRING WHEAT, NESOI, (EXCEPT SEED)	0	1	0	0	0
1001990040	WHITE WINTER WHEAT, EXCEPT SEED	0	0	0	1	0
1001990050	CANADIAN' WESTERN RED WINTER WHEAT, EXCEPT SEED	1	0	0	0	0
1001990060	SOFT WHITE SPRING WHEAT, EXCEPT SEED	0	0	0	1	0
Wheat Products						
1001990096	WHEAT AND MESLIN, EXCEPT DURUM WHEAT, SEED, NESOI	0	0.75	0.25	0	0
1101000000	WHEAT OR MESLIN FLOUR	1	0	0	0	0
1101000010	HARD SPRING WHEAT FLOUR	0	1	0	0	0
1101000020	DURUM WHEAT FLOUR	0	0	0	0	1
1101000030	WHITE WINTER WHEAT FLOUR	0	0	0	1	0
1101000060	WHEAT OR MESLIN FLOUR, NESOI	0	1	0	0	0
1101000050	WHEAT OR MESLIN FLOUR, CERTIFIED ORGANIC	1	0	0	0	0
1103110020	GROATS AND MEAL OF WHEAT, SEMOLINA	0	0	0	0	1
1103110040	GROATS AND MEAL OF WHEAT, NESOI	0	1	0	0	0
1103200010	PELLETS OF WHEAT	0	1	0	0	0
1103210000	PELLETS OF WHEAT	0	1	0	0	0
1902112000	PASTA WITH EGG UNCOOKED NOT STUFFED OR OTHRWSE PRE	0	0	0	1	0
1902112010	EGG PASTA, NT CKD, EU CTRY, SBJT TO INWD PROC REG	0	0	0	1	0
1902112020	EGG PASTA, NT CKD, EU CTRY, REDUCED EXP REFUND	0	0	0	1	0
1902112030	EGG PASTA, NOT COOKED, EU CTRY, OTHER	0	0	0	1	0
1902112090	EGG PASTA, NOT COOKED, OF A CTRY OTHER THAN EU.	0	0	0	1	0
1902114000	PASTA WITH EGG NESOI SAUCE NOT STUFFED/OTHRWS PREP	0	0	0	1	0
1902192000	PASTA NO EGG UNCOOKED NOT STUFFED OR OTHRWISE PREP	0	0	0	0.2	0.8
1902192010	PASTA NO EGG,UNCKD,NT STFD/OTHR PREP, SBJT TO IPR	0	0	0	0.2	0.8
1902192020	PASTA NO EGG,UNCKD,NT STFD, SBJT TO REDUCD REFUND	0	0	0	0.2	0.8
1902192030	PASTA NO EGG,UNCKD,NT STFD/OTHR PREP, OTHER	0	0	0	0.2	0.8
1902192090	PASTA NO EGG,UNCKD,NT STFD/OTHR PREP, NT EU CTRY	0	0	0	0.2	0.8
1902194000	PASTA NO EGG NESOI INCL SAUCE NT STUFF/OTHRWS PREP	0	0	0	0.2	0.8
1902400000	COUSCOUS, WHETHER OR NOT PREPARED	0	0	0	0	1
1904300000	BULGUR WHEAT, PRE COOKE OR OTHERWISE PREPARED	0.25	0.75	0	0	0

Wheat and wheat-product imports are allocated by Census category (HTS code) across the five classes using a fixed set of proportions (table 3). These proportions, by Census category, were developed in consultation with industry representatives. For example, the allocation of imports of bulgur (HTS code 1904300000) is made after converting the import data to grain-equivalent bushels. Then, 25 percent of these bushels are allocated to the HRW wheat class and 75 percent to the HRS wheat class. The durum and durum-product export allocation is taken directly from the converted Census data.

Estimating Wheat by Class Exports

Wheat exports are calculated differently than imports. Census export data is less detailed than import data necessitating the use of proportional weights to determine wheat by class exports for non-durum wheat. Grain exports and product data is available for durum, thus this class can be determined directly from converted product and grain Census data. An example of the methodology used to allocate non-durum exports by class is as follows:

Step 1. Sum all the Census non-durum grain and converted non-durum flour and products (in grain-equivalent bushels).For example: 242 million bushels of non-durum grain + 6 million grain-equivalent bushels of non-durum flour + 2 million grain-equivalent bushels of non-durum products = 250 million bushels

Step 2. Sum export sales and donations for the four non-durum classes and then calculate the proportion each class composes of this total.

Non-durum class	Export sales and donations	Share of 234 million bushels
HRW	120 million bushels	51 percent
HRS	56 million bushels	24 percent
SRW	30 million bushels	13 percent
White	28 million bushels	12 percent
Total	234 million bushels	100 percent

Step 3. Multiply the sum from Step 1 by the proportions calculated in Step 2 to estimate the bushels exported for each of the four classes of wheat.

HRW	250 × 0.51	= 128 million bushels
HRS	250 × 0.24	= 60 million bushels
SRW	250 × 0.13	= 32 million bushels
White	250 × 0.12	= 30 million bushels

Flour and Selected Products Included in Wheat Trade Estimates

All flours, but only selected wheat products are used in estimating wheat trade quantities for total wheat and durum wheat. The selected products included in the estimates are based on relative volumes traded. Wheat products included in by-class trade estimates are as follows: pasta made with eggs, pasta made without eggs, couscous, bulgur, and pellets. For couscous and pasta made without eggs, 80% of this volume is assumed to be made from durum. Table 2

and Table 3 identify the wheat products included in the wheat trade estimates. After flour and wheat products have been converted to grain-equivalent bushels, the associated export and import totals are then added to the data on the wheat grain exports and imports to obtain total wheat trade estimates.

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