

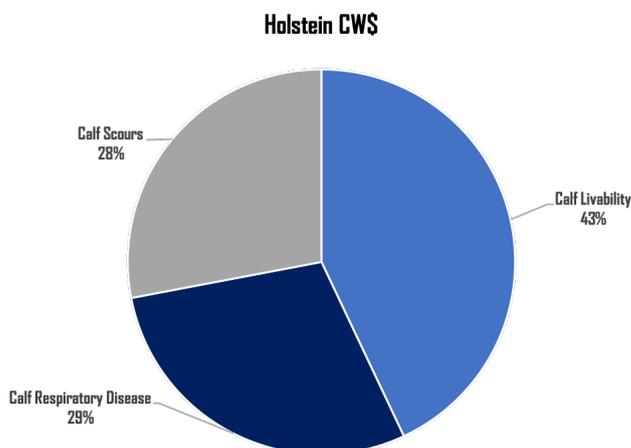


# Description of Terms

## CWS

Calf Wellness: Places economic weights on calf wellness traits, directly estimating potential profit contribution of these traits for an individual animal. This multi-trait selection index focuses solely on calf wellness traits with unique formulas used for Holsteins and Jerseys:

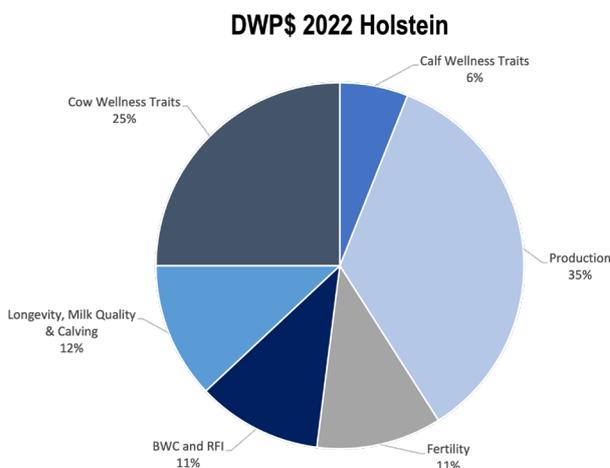
- Calf Livability
- Calf Scours (diarrhea)
- Calf Respiratory



## DWPS

Dairy Wellness Profit Index: A multi-trait selection index that includes production, fertility, type, longevity, and the wellness traits, including Polled test results with unique formulas used for Holsteins and Jerseys

- Cow Wellness Traits
- Calf Wellness Traits
- Production
- Fertility
- BWC and RFI
- Longevity, Milk Quality & Calving



## Feed Saved

Indicates the expected reduction of consumed feed per lactation based on evaluations for residual feed intake and body weight composite. Measured in pounds of dry matter intake.

## FLC

### Foot and Leg Composite

- Foot Angle 0.05
- Rear Legs Rear View 0.20
- Rear Legs Side View 0.05
- Feet and Legs Score 0.70
- Stature -0.20

## RFI

Residual Feed Intake: The difference between an animal's actual feed intake and its predicted feed intake calculated from various energy sinks [e.g., milk production, metabolic body weight (MBW), and change of body weight ( $\Delta BW$ )].

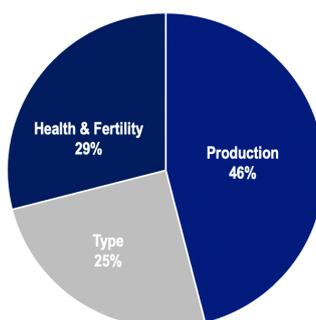


## TPI

Total Performance Index: This is a formula that combines type, management and production traits into one number. Very commonly used to rank bulls, TPI is the USA Holstein Association's multi trait index that ranks bulls on overall performance. TPI places more emphasis on type traits than the Net Merit formula, comparable emphasis on Fat and Protein production, and slightly lower emphasis on health traits. The traits included in the TPI formula, and their respective percentages in the formula in the chart below:

# 2021 TPI Formula

| Health & Fertility    | 29%   |
|-----------------------|-------|
| Fertility Index       | 13%   |
| Productive Life       | 5%    |
| SCS                   | -4%   |
| Livability            | 3%    |
| Health Trait Index    | 2%    |
| Daughter Calving Ease | -5%   |
| Daughter Stillbirth   | -1.5% |



| Production      | 46% |
|-----------------|-----|
| Protein         | 19% |
| Fat             | 19% |
| Feed Efficiency | 8%  |

| Type        | 25% |
|-------------|-----|
| Udders      | 11% |
| PTA Type    | 8%  |
| Feet & Legs | 6%  |

## UDC

Udder Composite Index (Holstein)

Udder Depth 0.20

Fore Udder 0.16

Rear Udder Height 0.23

Rear Udder Width 0.19

Udder Cleft 0.08

Front Teat Placement 0.04

Rear Teat Placement 0.05

Teat Length 0.05

Stature -0.20

## WTS

Wellness Trait Index: Places economic weights on wellness traits, directly estimating potential profit contribution of these traits for an individual animal. This multi-trait selection index focuses solely on wellness traits with unique formulas used for Holsteins and Jerseys:

Mastitis

Lameness

Metritis

Retained Placenta

Displaced Abomasum

Ketosis

Cow Aborts

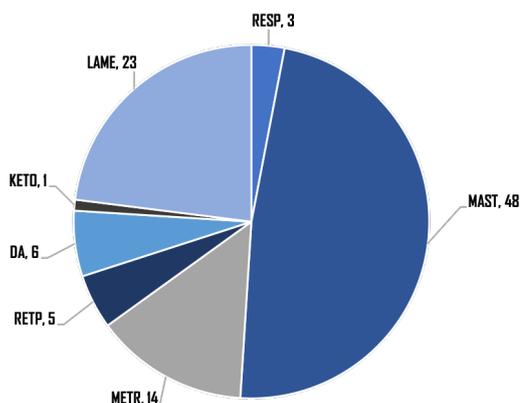
Milk Fever

Cystic Ovaries

Twinning

Economic value for Polled

WTS 2020 (HOLSTEIN)



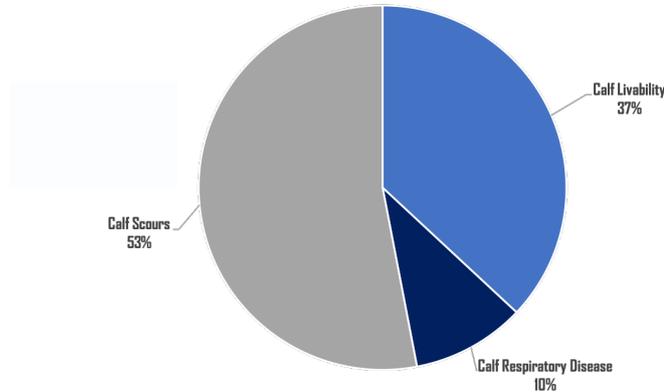


### CWS

Calf Wellness: Places economic weights on calf wellness traits, directly estimating potential profit contribution of these traits for an individual animal. This multi-trait selection index focuses solely on calf wellness traits with unique formulas used for Holsteins and Jerseys:

- Calf Livability
- Calf Scours (diarrhea)
- Calf Respiratory

**Jersey CWS**

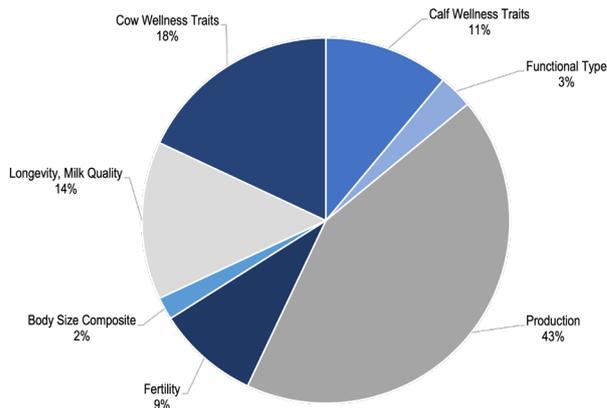


### DWPS

Dairy Wellness Profit Index: A multi-trait selection index that includes production, fertility, type, longevity, and the wellness traits, including Polled test results with unique formulas used for Holsteins and Jerseys

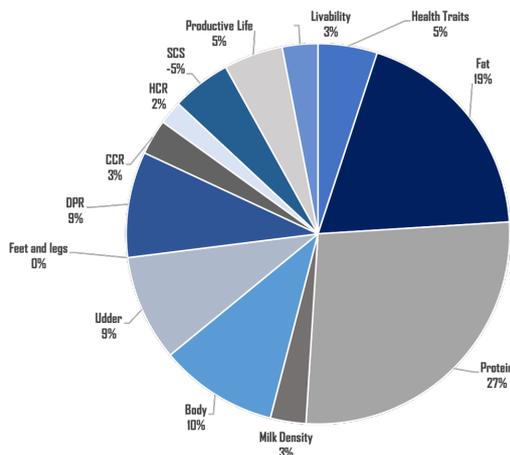
- Cow Wellness Traits
- Calf Wellness Traits
- Functional Type
- Production
- Fertility
- Body Size Composite
- Longevity, Milk Quality

**DWP\$ 2022 Jersey**



### Jersey Performance Index (JPI)

Jersey Performance Index is a formula for increasing production and improving milkfat and protein levels in the milk, moderating body weight in service of greater productive efficiency, and at the same time selecting for longer herd life, greater fertility, and better udder health.



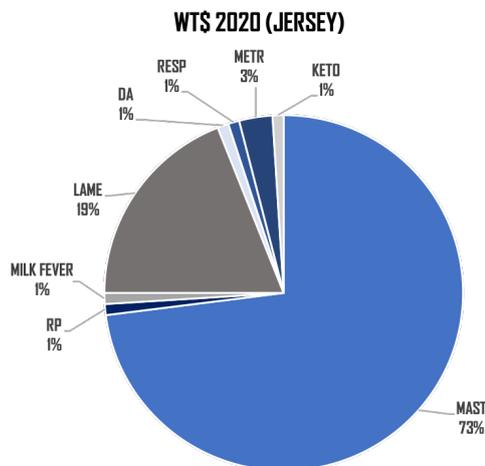
\*updated April 2022



### WTS

Wellness Trait Index: Places economic weights on wellness traits, directly estimating potential profit contribution of these traits for an individual animal. This multi-trait selection index focuses solely on wellness traits with unique formulas used for Holsteins and Jerseys:

- Mastitis
- Lameness
- Metritis
- Retained Placenta
- Displaced Abomasum
- Ketosis
- Cow Aborts
- Milk Fever
- Cystic Ovaries
- Twinning
- Economic value for Polled



### PTA CCR (COW CONCEPTION RATE)

Measures the ability of lactating cows to conceive. A CCR of 1.0 equates to a 1% increase in cow conception rate.

### CDCB Health Traits

Health traits available for Holsteins and Jerseys evaluated by CDCB and ranked by standard PTA values with a typical range of +/-3. Positive values indicate higher disease resistance when compared to breed average.

- Mastitis
- Metritis
- Retained Placenta
- Ketosis
- Milk Fever (Hypocalcemia)

### CMS

Cheese Merit: designed for herds that produce milk for cheese. Generally, Cheese Merit combines the same traits as Net Merit. The differences are a negative economic weight on PTA Milk and increased emphasis on Protein Pounds – because protein has more value in the cheese market than in other markets

### CODE #

The unique number registered with the National Association of Animal Breeders (NAAB) with which the AI companies use to identify sires.

### PTA DCE (DAUGHTER CALVING EASE)

This is the estimate of the Percentage of Difficult Births in Heifers (DBH) for a bull's daughters when they calve the first time. The average for the Holstein breed is 2.7%.

### PTA DPR (DAUGHTER PREGNANCY RATE)

Measures the cow's ability to begin cycling, show estrus, conceive and maintain pregnancy and is highly correlated with PL. A DPR of 1.0 equates to a 1% increase in pregnancy rate during a given 21 day estrus cycle. Every 1.0 PTA increase in DPR indicates 4 fewer days open.

### EFC

PTA EFC (Early First Calving) – places an economic value on the ability of virgin heifers to reach maturity and enter production, indicating whether heifers will calve earlier or later than breed average. One standard deviation (+/-1.0 EFC) is equivalent to approximately 3 days, with positive values being favorable for younger age at first calving.

\*updated April 2022



## **DTRS**

The number of milking daughters this sire has in his proof.

## **FAT**

The average fat production of a bull's daughters in a 305 day lactation (expressed in pounds).

## **FAT%**

The average fat% of a bull's daughters.

## **FE**

The Feed Efficiency (FE) Index considers the individual feed costs to produce an extra pound of milk, fat and protein while accounting for differences in maintenance costs, housing costs and calving weights that may be attributed to the size of the cow. Cows that produce high volumes of milk without requiring high volumes of feed are rewarded in this index.

$FE = (\text{dollar value of milk produced}) - (\text{feed cost of extra milk}) - (\text{extra maintenance cost})$

## **FI**

Fertility Index (FI) combines values from three measures of reproductive performance to provide one overall fertility score.

$\text{Fertility Index} = 0.7 * \text{DPR} + 0.1 * \text{CCR} + 0.1 * \text{HCR} + 0.1 * \text{EFC}$ .

## **PTA GL (GESTATION LENGTH)**

Expressed as the number of days greater than or less than the average gestation length for the breed. The typical range is +/-5 days. In general, gestation length has decreased over time for breeds that have selected for lower calving ease (i.e. Holstein), as calving ease and gestation length are highly correlated. Gestation Length is available for all dairy breeds.

## **HCR**

PTA HCR (Heifer Conception Rate) – measures the ability of virgin heifers to conceive. An HCR of 1.0 equates to a 1% increase in heifer conception rate.

## **HERDS**

The number of herds where this bull's daughters are milking.

## **HHPS**

Herd Health Profit Index is a SSI/WWS proprietary index that is designed to produce cows that are productive and built to last and intended for use in herds that do not have access to DWP\$ or Clarifide Plus evaluations.

## **KC**

Kapa Casein: This indicates the "type" of Casein (milk protein) a bulls daughters will have – AA, AB or BB.

## **PTA LIV (LIVABILITY)**

The percent of a bull's daughters above or below the average of the breed that remain alive in the herd until they can be culled and provide a source of income for the herd.

## **MILK**

The average milk production of a bull's daughters in a 305 day lactation (expressed in pounds: 1 kg =2.2 pounds).

## **NMS**

Net Merit: Economic value which combines the value of production, health, fertility and type scores. NM\$ the expected lifetime profitability of a bull's average daughter as calculated by the USDDAIIPL. The traits included in the NM\$ formula and their respective percentages in the formula are:



## NM\$

### Production

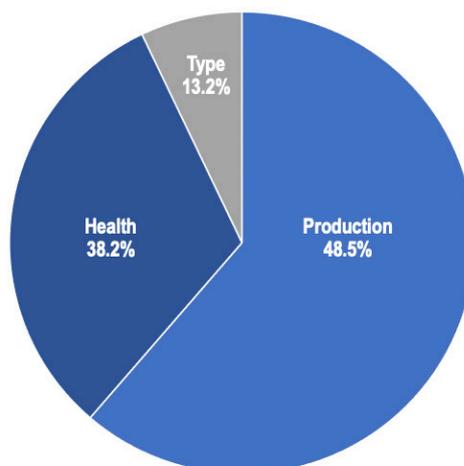
|         |      |
|---------|------|
| Milk    | 0.3  |
| Fat     | 28.6 |
| Protein | 19.6 |

### Type

|     |      |
|-----|------|
| BWC | -9.4 |
| UDC | 3.4  |
| FLC | 0.4  |

### Health

|       |      |
|-------|------|
| PL    | 15.9 |
| SCS   | -2.8 |
| DPR   | 4.1  |
| CAS   | 2.9  |
| HCR   | 0.4  |
| CCR   | 1    |
| LIV   | 4.4  |
| HTH\$ | 1.2  |
| RFI   | -3.8 |
| EFC   | 1.2  |
| HLIV  | 0.5  |



### PTA PL (PRODUCTIVE LIFE)

A score used to identify the productive months of life a cow will have compared to herd mates. A PL of 1.0 equates to one additional month of production in the herd. PL gives the greatest weight to the first 305 days (10 months) of lactation, as cows are most profitable and productive in early lactation.

### PRO

The average protein production of a bull's daughters in a 305 day lactation (expressed in pounds). Protein in USA evaluations is TRUE protein, which is 0.2% lower than Crude Protein.

### PRO%

The average protein % (True Protein) of a bull's daughters. To convert from True Protein to Crude Protein, add 0.2% to the True Protein value.

### PTA%F, PTAF

Predicted ability of sire to transmit genetics for fat production, this is the amount of fat a bull's daughters are expected to produce above contemporaries.

### PTA%P, PTAP

Predicted ability of sire to transmit genetics for protein production, this is the amount of TRUE protein a bull's daughters are expected to produce above contemporaries.

### PTAM

Predicted ability of sire to transmit genetics for milk production. The pounds of milk produced by a bull's daughters above contemporaries

### REGNAME

The herdbook name of the bull.

### PTA SCE (SIRE CALVING EASE)

This is the estimate of the Percentage of Difficult Births in Heifers (DBH) when they calve the first time. The average for the Holstein breed is 2.2%.

### SCE OBS

Number of calvings observed



### **SCR**

Sire Conception Rate – this is not a genetic trait, but measures the fertility of the bull. An SCR of 1.0 indicates a 1% increase in conception rate when compared to average.

### **PTA SCS (SOMATIC CELL SCORE)**

Measures a bull's milking daughter's susceptibility to mastitis. The USA herd average is set to 3.00 (as zero) with lower proof values indicating lower somatic cell count.

### **TYPE**

PTA Type (PTAT) or conformation improvement expected from a bull's daughters compared to contemporaries.