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# 11. PIGBLUP Interface Specifications

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## Input Files

For most clients, the only file format of interest is that for the file containing the animal pedigree and performance data – the *data input file*. There are, however, many other files containing configuration settings (PBLUP.FIG), limits of various sorts (LIMITS.TXT), economic and market data (ECONX.TXT), payments grid data (AUSMEAT.DAT, PAYGRIDS.TXT, and various .GRD files), genetic parameters (GENPAR.DAT), breed analysis settings (FARM1.INP), etc.

With version 4.00, most of these files were made self-explanatory: settings are identified by a meaningful parameter name and may be accompanied by descriptive comments.

Most of these files may be edited from within PIGBLUP. The exceptions are the configuration file and, currently, the payments grid file. We recommend files be edited within PIGBLUP when possible.

Prior to version 4.20 of PIGBLUP, animal Id width was fixed at 10 characters. With version 4.20, clients can arrange to be supplied with a version with a different animal Id width. The data input file layouts below all assume a 10-character animal Id. If a different Id width is used, the field start columns must be adjusted accordingly.

The Id width supplied to a client is indicated in the PIGBLUP configuration file, PBLUP.FIG, as a record of the form:

*AnimalIdWidth=10 # comment*

Changing this setting is permitted within a limited range. By default, PIGBLUP will handle identifiers with up to 12 characters, but versions that handle longer Id lengths can be created upon request.

PIGBLUP versions prior to 4.20 lack this record in their configuration files. Absence of this record indicates a 10-character animal Id width.

## Data File Formats

As of PIGBLUP version 4.20, data files should begin with a header record indicating the data file format in which it is encoded. This header is of the form

*# V2.1*

This information is not used yet. PIGBLUP version 4.20 and later will read these files, but will not make use of the data file format header. PIGBLUP versions prior to version 4.20 will fail reading files containing this header information.

In the following tables:  
 i = numeric field (integer)  
 A = alphanumeric field  
 • = compulsory fields.

**Animal Record (Record type 1):  
 (Formats 1.0 to 2.1)**

		Format 1.0		Format 1.1		Format 2.0		Format 2.1	
		Col.	Col.	Col.	Col.	Col.	Col.	Col.	
Record Type Identification	*	1	1	1	1	1	1	1	1
Animal Identification	*	A10	2	A10	2	A10	2	A10	2
Animal Breed	*	A2	12	A2	12	A2	12	A2	12
Dam Identification		A10	14	A10	14	A10	14	A10	14
Sire Identification		A10	24	A10	24	A10	24	A10	24
Date of Birth [1]	*	3I2	34	3I2	34	2I2,I4	34	2I2, I4	34
Sex	*	A1	40	A1	40	A1	42	A1	42
Litter size the animal was born in [3]		I2	41	I2	41	I2	43	I2	43
Number of Production+Carcase records [3]		I1	43	I1	43	I1	45	I1	45
Number of Litter records [3]		I2	44	I2	44	I2	46	I2	46
Flag if animal is 'active' [2]		A1	46	A1	46	A1	48	A1	48

**Mate Selection/Allocation Data:**

Status Code [4]		A1	47	A1	47	A1	49	A1	49
Status Date [1]		3I2	48	3I2	48	2I2,I4	50	2I2,I4	50
Status Parity		I2	54	I2	54	I2	58	I2	58
Status Boar [5]		A10	56	A10	56	A10	60	A10	60

**(Recommended New Format 3.0)**

		Format 3.0	Col.
Record Type Identification	*	1	1
Animal Identification	*	A10	2
Animal Breed	*	A2	12
Dam Identification		A10	14
Sire Identification		A10	24
Date of Birth [1]	*	2I2,I4	34
Sex	*	A1	42
Flag if animal is 'active' [2]		A1	43

**Mate Selection/Allocation Data:**

Status Code [4]		A1	44
Status Date [1]		2I2,I4	45
Status Parity		I2	53
Status Boar [5]		A10	55

Note:

[1] 3I2 for DDMMYY dates; 2I2,I4 for DDMMYYYY dates [2] "A" if active; otherwise, blank. [3] Now ignored; PigBLUP uses Record Identifiers alone. [4] User-assigned boar and sow status codes (eg For sow, Mating, Pregnant, At Risk, ..). [5] Mating sire (if applicable).

On the following records, missing measurements should be left blank rather than being set to zero.

**Animal Record (Record type 2):  
(Formats 1.0 to 2.1)**

	*	Format		Format		Format		Format	
		V1.0	Col.	V1.1	Col.	V2.0	Col.	V2.1	Col.
Record Type Identification	*	2	1	2	1	2	1	2	1
Animal Identification	*	A10	2	A10	2	A10	2	A10	2
Animal Breed	*	A2	12	A2	12	A2	12	A2	12
Weight at End of Test		I3	14	I3	14	I3	14	I3	14
Date at End of Test [1]		3I2	17	3I2	17	2I2,I4	17	2I2,I4	17
User Recorded Management Group		A1	23	A2	23	A1	25	A2	25
Back Fat [2]		I2	24	I3	25	I2	26	I3	27
Extra Prod. Trait - OP1 [4]		I3	40	I3	40	I3	28	I3	30
Weight at Start of Test		I2	26	I2	28	I2	31	I2	33
Date at Start of Test [1]		3I2	28	3I2	30	2I2, I4	33	2I2, I4	35
Feed Conversion Ratio		I3	34	I3	36	I3	41	I3	43
Limits over-ride flag [3]		2X, A1	39	A1	39	A1	44	A1	46
Extra Prod. Trait - OP2		A6	43	A6	43	A6	45	A6	47
Extra Prod. Trait - OP3		A6	49	A6	49	A6	51	A6	53
Extra Prod. Trait - OP4		A6	55	A6	55	A6	57	A6	59
Extra Prod. Trait - OP5		A6	61	A6	61	A6	63	A6	65
Extra Prod. Trait - OP6		A6	67	A6	67	A6	69	A6	71
Extra Prod. Trait - OP7		A6	73	A6	73	A6	75	A6	77
Extra Prod. Trait - OP8		A6	79	A6	79	A6	81	A6	83
Extra Prod. Trait - OP9		A6	85	A6	85	A6	87	A6	89
Extra Prod. Trait - OP10		A6	91	A6	91	A6	93	A6	95
Extra Prod. Trait - OP11		A6	97	A6	97	A6	99	A6	101

**(Recommended New Format 3.0)**

	*	Format	
		V3.0	Col.
Record Type Identification	*	2	1
Animal Identification	*	A10	2
Animal Breed	*	A2	12
Weight at Start of Test		I3	14
Date at Start of Test [1]		2I2,I4	17
Weight at End of Test		I3	25
Date at End of Test [1]		2I2,I4	28
User Recorded Management Group		A5	36
Reserved for future use		11X	41
Limits over-ride flag [3]		A1,3X	52
Back Fat [2]		A6	56
Feed Conversion Ratio		A6	62
Extra Prod. Trait - OP1 [4]		A6	68
Extra Prod. Trait - OP2		A6	74
Extra Prod. Trait - OP3		A6	80
Extra Prod. Trait - OP4		A6	86
Extra Prod. Trait - OP5		A6	92
Extra Prod. Trait - OP6		A6	98
Extra Prod. Trait - OP7		A6	104
Extra Prod. Trait - OP8		A6	110
Extra Prod. Trait - OP9		A6	116
Extra Prod. Trait - OP10		A6	122
Extra Prod. Trait - OP11		A6	128

Note:

[1] 3I2 for DDMMYY dates; 2I2,I4 for DDMMYYYY dates. [2] In V1.1 and V2.1, 22 mm should appear as 220. [3] A "V" in this field indicates out-of-limits values on this record are valid. [4] "Live ultra-sonic muscle depth" by default. [5] By default, values for FCR are x100 (ie, 2.14 appears as 214).

**Carcase Record (Record type 3):  
(Formats for 1.0 to 2.1)**

		Format		Format		Format		Format	
		V1.0	Col.	V1.1	Col.	V2.0	Col.	V2.1	Col.
Record Type Identification	*	3	1	3	1	3	1	3	1
Animal Identification	*	A10	2	A10	2	A10	2	A10	2
Animal Breed Code	*	A2	12	A2	12	A2	12	A2	12
Carcase Fat Depth [1]		I3	14	I3	14	I3	14	I3	14
Carcase Muscle Depth [1]		I3	17	I3	17	I3	17	I3	17
Lean Meat Percentage [1]		I3	20	I3	20	I3	20	I3	20
Slaughter Weight		I4	23	I4	23	I4	23	I4	23
Date of Slaughter [2]		3I2	27	3I2	27	2I2,I4	27	2I2,I4	27
User Recorded Management Group		A2	33	A2	33	A2	35	A2	35
Limits over-ride flag [3]		A1	35	A1	35	A1	37	A1	37
Extra Carcase Trait - OC0		A5	36	A5	36	A5	38	A5	38
Extra Carcase Trait - OC1		A6	41	A6	41	A6	43	A6	43
Extra Carcase Trait - OC2		A6	47	A6	47	A6	49	A6	49
Extra Carcase Trait - OC3		A6	53	A6	53	A6	55	A6	55
Extra Carcase Trait - OC4		A6	59	A6	59	A6	61	A6	61
Extra Carcase Trait - OC5		A6	65	A6	65	A6	67	A6	67
Extra Carcase Trait - OC6		A6	71	A6	71	A6	73	A6	73
Extra Carcase Trait - OC7		A6	77	A6	77	A6	79	A6	79
Extra Carcase Trait - OC8		A6	83	A6	83	A6	85	A6	85
Extra Carcase Trait - OC9		A6	89	A6	89	A6	91	A6	91
Extra Carcase Trait - OC10		A6	95	A6	95	A6	97	A6	97
Extra Carcase Trait - OC11		A6	101	A6	101	A6	103	A6	103
Extra Carcase Trait - OC12		A6	107	A6	107	A6	109	A6	109

**(Recommended New Format 3.0)**

		Format	
		V3.0	Col.
Record Type Identification	*	3	1
Animal Identification	*	A10	2
Animal Breed Code	*	A2	12
Slaughter Weight		I4	14
Date of Slaughter [2]		2I2,I4	18
User Recorded Management Group		A5	26
Reserved for future use		11X	31
Limits over-ride flag [3]		A1,3X	42
Carcase Fat Depth [1]		A6	46
Carcase Muscle Depth [1]		A6	52
Lean Meat Percentage [1]		A6	58
Extra Carcase Trait - OC0		A6	64
Extra Carcase Trait - OC1		A6	70
Extra Carcase Trait - OC2		A6	76
Extra Carcase Trait - OC3		A6	82
Extra Carcase Trait - OC4		A6	88
Extra Carcase Trait - OC5		A6	94
Extra Carcase Trait - OC6		A6	100
Extra Carcase Trait - OC7		A6	106
Extra Carcase Trait - OC8		A6	112
Extra Carcase Trait - OC9		A6	118
Extra Carcase Trait - OC10		A6	124
Extra Carcase Trait - OC11		A6	130
Extra Carcase Trait - OC12		A6	136

Note:

[1] In V1.1 and V2.1, there is an implicit decimal point (eg, 567 encodes 56.7). [2] 3I2 for DDMMYY dates; 2I2,I4 for DDMMYYYY dates. [3] A "V" in this field indicates out-of-limits values on this record are valid.

**Reproduction Record (Record type 4):  
(Formats for 1.0 to 2.1)**

	*	Format V1.0		Format V1.1		Format V2.0		Format V2.1	
		Col.	Col.	Col.	Col.	Col.	Col.	Col.	
Record Type Identification	*	4	1	4	1	4	1	4	1
Animal Identification	*	A10	2	A10	2	A10	2	A10	2
Animal Breed Code	*	A2	12	A2	12	A2	12	A2	12
Parity Number		I2	14	I2	14	I2	14	I2	14
Mating date [1]		3I2	16	3I2	16	2I2,I4	16	2I2,I4	16
Service Sire Identification		A10	22	A10	22	A10	24	A10	24
Service Sire Breed		A2	32	A2	32	A2	34	A2	34
Mating Type [2]		A1	34	A1	34	A1	36	A1	36
Date of Farrowing [1]		3I2	35	3I2	35	2I2,I4	37	2I2,I4	37
Piglets Born Alive		I2	41	I2	41	I2	45	I2	45
Piglets Born Dead		I2	43	I2	43	I2	47	I2	47
User-Recorded Management Group		A1	45	A1	45	A1	49	A1	49
Number of Piglets at Transfer [5]		I2	46	I2	46	I2	50	I2	50
Date of Transfer of Piglets [1]		3I2	48	3I2	48	2I2,I4	52	2I2,I4	52
Total weight of Piglets at Transfer [6]		I3	54	I3	54	I3	60	I3	60
Number of Piglets at Weighing		I2	57	I2	57	I2	63	I2	63
Date of Weighing [1]		3I2	59	3I2	59	2I2, I4	65	2I2, I4	65
Total weight of piglets at weighing [7]		I3	65	I3	65	I3	73	I3	73
Wearing Date [4]		3I2	70	3I2	70	2I2, I4	76	2I2, I4	76
Farrowing limits over-ride flag [3]		A1	68	A1	68	A1	84	A1	84
Litter weight limits over-ride flag [3]		A1	69	A1	69	A1	85	A1	85
Number at Weaning [9]	I2	76	I2	76	I2	86	I2	86	I2
Extra Reproduction Trait – OR1 [8]	A6	78	A6	78	A6	88	A6	88	A6
Extra Reproduction Trait – OR2 [8]	A6	84	A6	84	A6	94	A6	94	A6
Extra Reproduction Trait – OR3 [8]	A6	90	A6	90	A6	100	A6	100	A6
Extra Reproduction Trait – OR4 [8]	A6	96	A6	96	A6	106	A6	106	A6
Extra Reproduction Trait – OR5 [8]	A6	102	A6	102	A6	112	A6	112	A6
Extra Reproduction Trait – OR6 [8]	A6	108	A6	108	A6	118	A6	118	A6
Extra Reproduction Trait – OR7 [8]	A6	114	A6	114	A6	124	A6	124	A6
Extra Reproduction Trait – OR8 [8]	A6	120	A6	120	A6	130	A6	130	A6

**(Recommended New Format 3.0)**

	Format	
	V3.0	Col.
Record Type Identification	4	1
Animal Identification	A10	2
Animal Breed Code	A2	12
Parity Number	I2	14
Service Sire Identification	A10	16
Service Sire Breed	A2	26
Mating Type [2]	A2	28
Mating date [1]	2I2,I4	30
Date of Farrowing [1]	2I2,I4	38
Piglets Born Alive	I2	46
Piglets Born Dead	I2	48
Number of Piglets at Transfer [5]	I2	50
Date of Transfer of Piglets [1]	2I2,I4	52
Total weight of Piglets at Transfer [6]	I3	60
Number of Piglets at Weighing	I2	63
Date of Weighing [1]	2I2, I4	65
Total weight of piglets at weighing [6]	I3	73
Number at Weaning	I2	76
Wearing Date	2I2, I4	78
User-Recorded Management Group	A5	86
Reserved for future use	11X	91
Farrowing limits over-ride flag	A1	102
Litter weight limits over-ride flag [3]	A1	103
Reserved for future use	2X	104
Extra Reproduction Trait – OR1 [8]	A6	106

Extra Reproduction Trait – OR2 [8]	A6	112
Extra Reproduction Trait – OR3 [8]	A6	118
Extra Reproduction Trait – OR4 [8]	A6	124
Extra Reproduction Trait – OR5 [8]	A6	130
Extra Reproduction Trait – OR6 [8]	A6	136
Extra Reproduction Trait – OR7 [8]	A6	142
Extra Reproduction Trait – OR8 [8]	A6	148

Note:

[1] 3I2 for DDMMYY dates; 2I2,I4 for DDMMYYYY dates.

[2] Eg, "A" for AI and "N" for natural mating and "C" for Combination mating, these mating types will be combined with breed of litter (purebred versus crossbred litter) to form mating type by litter breed classes used in the model.

[3] A "V" in this field indicates out-of-limits values on this record are valid.

[4] Weaning-to-Conception uses Weaning Date, if given; otherwise, Date of Weighing.

[5] Refers to the number of piglets in the litter after transfer. In some cases, there will be piglets added from the litter of a sow with too many piglets.

[6] Refers to the combined weight of the piglets transferred (usually at 3 days of age). This information is needed only when 'Weight pre-adjust method 2' is selected.

[7] At the weighing date (about 20-30 days after transfer, the number and combined weight of the remaining piglets are recorded.

[8] Not implemented yet. [9] Weaning-to-conception used Number weaned if given; otherwise Number of piglets at weighing.

**IGF1 Record (Record type 5):**  
(Formats for 1.0 to 2.1)

		Format V1.0	Col.	Format V1.1	Col.	Format V2.0	Col.	Format V2.1	Col.
Record Type Identification	*	5	1	5	1	5	1	5	1
Animal Identification	*	A10	2	A10	2	A10	2	A10	2
Animal Breed Code	*	A2	12	A2	12	A2	12	A2	12
IGF1 Value		I3	14	I3	14	I3	14	I3	14
Date of Sampling		3I2	17	3I2	17	2I2, I4	17	2I2, I4	17
User Recorded management Group		A2	23	A2	23	A2	25	A2	25
IGF1-Batch Number within day		A2	25	A2	25	A2	27	A2	27
IGF1 Parity of Dam		I2	27	I2	27	I2	29	I2	29
IGF1 Limits over-ride flag [1]		A1	29	A1	29	A1	31	A1	31
Extended Batch No. [2]		A15	30	A15	30	A15	32	A15	32

**(Recommended New Format 3.0)**

		Format V3.0	Col.
Record Type Identification	*	5	1
Animal Identification	*	A10	2
Animal Breed Code	*	A2	12
IGF1 Value		A3	14
Date of Sampling		2I2, I4	17
User Recorded management Group		A5	25
IGF1-Batch Number within day		A2	30
IGF1 Parity of Dam		I2	32
IGF1 Limits over-ride flag [1]		A1	34
Extended Batch No. [2]		A15	35

Note:

[1] A "V" in this field indicates out-of-limits values on this record are valid. [2] If non-blank, Extended Batch No. is used; otherwise IGF-1 Batch No. is used.

In all tables:  
 A = alphanumeric field  
 I = numeric field  
 \* = compulsory field

**Further Notes:**

Where measurements are missing, the corresponding data file field should be left blank – not set to zero or some other value.

Animals should be flagged as “active” only if they are not parents and are too old to be *implicitly* flagged as “active”.

## The Active Flag in Record Type 1

The flag in the animal record (record number 1) indicates that the animal has been selected for breeding and is still active in the herd.

Animals need to be explicitly flagged as active **only** when they would not be treated as 'active' automatically. That is, if they were born more than 200 days ago (the default implicit flagging setting in the Alter BLUP Model Parameters screen) and are not indicated as being parents by virtue of being recorded as a parent or service sire or having reproduction records.

Flagging all animals as being active in a data file can cause the size limits of your version of PIGBLUP to be exceeded.

The output of PIGBLUP contains only parents (boars or sows with tested offspring) and tested piglets younger than 200 days (this value is variable). For example, a selected gilt will disappear from the output until she farrows. To avoid this you can flag these animals with an "A" for active to indicate that you are still interested in their EBVs.

This is also important for the Mate Selection Module, to mark animals that have to be mated.

## Sequence of Records

The data file must be sorted by date of birth (oldest animals first).  
Within animal the records have to be sorted by record type and  
record type 4 has to be sorted by parity number.

This means: The oldest animal comes first, beginning with its animal record, then the production record (if available), the carcass record (if available) followed by the reproduction records (if it's a sow and litter records are available) with the record for the first litter first, next the second litter and so on.

## Animals to be Extracted

All animals should be extracted from the herd management system which have either production or reproduction observations recorded.

Any animal which only appears as a sire or dam and has unknown parentage does not need its own type 1 record, except in a multiple breed evaluation.

It is important that both production and reproduction data are supplied where available to allow PIGBLUP to use the pedigree information and to make comparisons across years possible (eg estimation of Genetic and Environmental Trends).

## User-recorded Management Groups

The "User recorded Management Groups" in record types 2, 3 and 4 should be included if you are employing different housing or management regimes for raising animals in the particular herd, to identify animals that have suffered prolonged illness or pigs taken to different abattoirs. This makes sure that only animals that have been treated the same way are compared.

Failure to use management groups will cause poor performance, eg due to sickness, to be attributed to inferior genetics. Such animals and their relatives will be penalised wrongly.

Currently, there is a maximum of 50 different user recorded management subgroups possible.

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## Output Files

PIGBLUP's analytic modules output a number of files containing *estimated breeding values* (EBVs), trend information, and trait identification information.

For those users wishing to upload the EBVs and multiple indexes into a herd recording database, descriptions are given for the EBVs and indexes files as well as the trait identification file.

If you examine the files in a breed subdirectory, you may see the files FXCUSTOM.RAW, CUSTOM.RAW and INDEXES.RAW. If you have not requested PIGBLUP to *Use User-Defined Base*, these files will be identical with FXCUSTOM.INX, CUSTOM.INX and INDEXES.INX. That is, the EBVs and indexes are those output by the solvers. However, if you have requested *Use User-Defined Base*, these files contain EBVs and indexes *relative* to those of the base animals.

## EBVs File

Should you want to process the EBVs externally to PIGBLUP, you have a choice of files: FXCUSTOM.INX and CUSTOM.INX.

FXCUSTOM.INX is recommended for easier programming and reduced maintenance.

With FXCUSTOM.INX you can control whether a header is included or not and whether each EBV is always written to the same record position regardless of which EBVs are 'ticked' for analysis; you have no such control of the CUSTOM.INX file.

## FXCUSTOM.INX

The default is that this file will not be written; you need to set the configuration file parameter *Write\_Fixed* for this fixed field file to be generated (in addition to CUSTOM.INX) during an analysis.

With the fixed field FXCUSTOM.INX file, every EBV (whether it is ticked or not) will be written in canonical order and thus have a fixed record position regardless of which EBVs are ticked. Note that unanalysed EBVs are written with a 0.0 value.

If you want a fixed field file with comma or horizontal tab (htab) delimited fields, edit the *FieldSeparator* parameter in the configuration file to read '*FieldSeparator=comma*. or '*FieldSeparator=htab*. Any other setting generates a blank separator.

A '*FixedHeader*' field has been added to the configuration file to control whether the FXCUSTOM.INX file is written with or without a header. This header may hinder easy uploading of animal EBVs by third party programs.

The header, when it is written, consists of the records

```
#FXCUSTOM.INX
# Order of Traits is
#   Index   Index+Offset
#   ADG    TDG    BF      FCR      LMD      OP2      OP3      OP4      OP5  OP6
#   OP7    OP8    OP9     OP10     OP11     CFat     CMus     %Lean   OC0  IGF1
#   OC1    OC2    OC3     OC4      OC5      OC6      OC7      OC8     OC9  OC10
#   OC11   OC12   NBA1    NBA2     LW21D1   LW21D2   WCI      NBA     LW21D
#NOTE: The last column is always zero.
```

Note that all traits (whether analysed or not) are listed in the header.

## CUSTOM.INX

The CUSTOM.INX file is used internally by PIGBLUP. It is a legacy file with an awkward format but whose structure must be maintained as many clients have built programs that use it.

### *First row of CUSTOM.INX:*

The first row contains a series of zeros and ones, one digit for each possible trait, to indicate whether the trait was 'ticked' in the analysis that generated the CUSTOM.INX file.

With PIGBLUP V5.00 and V5.01, the canonical trait ordering was

```
ADG TDG BF FCR dummy CFAT CMUS LMY IGF1 dummy NBA1 NBA2 LW211 LW212
WCI NBA LW21 $INDEX
```

With PIGBLUP V5.10, the ordering was

```
ADG TDG BF FCR LMD CFAT CMUS LMY IGF1 dummy NBA1 NBA2 LW211 LW212
WCI NBA LW21 $INDEX
```

With PIGBLUP V5.20, the ordering is

```
ADG TDG BF FCR LMD CFAT CMUS LMY XCarc IGF1 dummy NBA1 NBA2 LW211
LW212 WCI NBA LW21 $INDEX
```

where XCarc is the user-definable trait on the carcass record (record type 3).

With PIGBLUP V6.00, the ordering is

```
ADG TDG BF FCR OP1 ... OP11 CFAT CMUS LMY OC0 IGF1 OC1 ... OC12
NBA1 NBA2 LW211 LW212 WCI NBA LW21 $INDEX
```

where O<sub>Pi</sub>, i=1,...,11 are other user-definable traits on the production record (record type 2) and O<sub>Ci</sub>, i=1,...,12 are other user-definable traits on the carcass record (record type 3).

**Subsequent rows:**

As mentioned previously, the formats below assume a 10-character Animal Id width (**a10**). If a different width is being used, the formats must be modified accordingly. For example, if a 12-character width ID is being used, the **a10** field would become **a12** – and all subsequent fields shift accordingly.

Only the analysed EBVs of each animal are written in a *variable field* format to CUSTOM.INX .

Because the '\$INDEX' in some currencies needs more digits than in others, PIGBLUP gets the size of the \$INDEX field from the *IndexFormat* parameter in the configuration file, PBLUP.FIG. The default setting is '*f9.3*' which indicates the \$INDEX field spans 9 characters and there are 3 decimal places to the right of the decimal point. Clients can alter this setting to '*f12.1*' say if the default setting does not provide sufficient space to hold the \$INDEX.

PIGBLUP builds the CUSTOM.INX file format using the Animal ID width, index field width, etc. Thus, the format of the CUSTOM.INX file (using default settings) is:

**(a10, i4, 10x, i2, 1x, 3i2, 3i2, 1x, f9.3, 3x, f9.3, 20f8.3)**

The fields output are as follows:

Animal ID	a10
Breed indicator	i4
Reserved space	10x
Sex indicator	i2
Date of birth	3i2
Date off-test	3i2
Index value	f9.3
Index + <i>Offset</i>	f9.3
NBA EBV	f8.3
Other trait EBVs	f8.3

Breed indicator is the ordinal of the breed mnemonic found in the breed directory file BREEDS.SYN.

The variable format file (CUSTOM.INX) lists ticked EBVs only (ie, EBVs with 1's in the record 1 mask) in adjacent fields in the canonical order for the version (except NBA, which always occurs immediately after \$INDEX + *Offset* - even if not ticked).

For example,

\$INDEX, \$INDEX + *Offset*, NBA, ADG, TDG, BF, FCR, CMUS, CFAT, LMY, LW21

Note: If any EBV in the above list, other than \$INDEX or NBA, is not ticked for analysis, it does not appear in CUSTOM.INX. For example, if ADG and FCR are the only EBVs ticked, CUSTOM.INX contains the following EBV fields:

\$INDEX, \$INDEX + *Offset*, 0.0, ADG, FCR

*Offset* is a positive number (determined by the PBLUP.FIG format field) which is large enough to ensure that \$INDEX + *Offset* is always positive. The 0.0 field is a place holder only for the NBA EBV. It is present even though NBA in the example above was not ticked.

If BF was also ticked, the EBV fields would become:

\$INDEX, \$INDEX + *Offset*, 0.0, ADG, BF, FCR

**Altering the Index Format:**

For PIGBLUP to write the \$INDEX into a 12-character wide field, say, edit the *IndexFormat* parameter in the PBLUP.FIG file from its default setting of '*IndexFormat=f9.3*' to '*IndexFormat=f12.1*'.

**Indexes File (INDEXES.INX)**

PIGBLUP has a multiple index capability but FXCUSTOM.INX and CUSTOM.INX have provision for a single index. PIGBLUP now writes an INDEXES.INX file whose records match the order of animals in the FXCUSTOM.INX and CUSTOM.INX.

The first record of this file lists the mnemonic of each index in the order its value appears in subsequent records.

The indexes record for each animal consists of the Animal ID followed by the value of each calculated index.

As FXCUSTOM.INX and CUSTOM.INX reports a single index value, the question arises *Which index appears in CUSTOM.INX?*

By default, the last Index calculated is the one appearing in FXCUSTOM.INX and CUSTOM.INX. You must use the *Post-Analysis/Select Index for Upload to Herd Recording System* option in PIGBLUP to re-write FXCUSTOM.INX and CUSTOM.INX with a selected index from the INDEXES.INX file.

## Trait Identification File (TRAITS.DEF, TRAITS.TSD)

PIGBLUP is supplied with a TRAITS.DEF file in the installation directory. Whenever, you define a new breed, the TRAITS.DEF file is copied to the breed subdirectory and renamed TRAITS.TSD.

TRAITS.DEF contains definition details for each trait and a generic index trait. Each trait has its own definition record. The order of each record must be preserved.

TRAITS.DEF has an extensive header describing the function of each field in a trait definition record. By reading this header and following the supplied definitions in the records that follow, you should obtain a fair understanding of how PIGBLUP uses these fields.

PIGBLUP is issued with *standard* traits (ie, ADG, TDG, BF, FCR, LMD, CFat, CMus, LMY, IGF1, NBA1, NBA2, 21D1, 21D2, WCI) pre-defined. Default definitions are included for other production and carcass traits.

The definition of every *OTHER* type trait (ie OPi and OCi) may be changed. Although the *standard* traits' definitions may be changed, you may need to consult with your supplier if you want to re-define ADG, TDG, FCR or a reproduction trait. As yet, trait re-definition is not completely general; you may require the assistance of AGBU - the developers of PIGBLUP.