



PAG XXVI

ISGC meeting Monday 15th January 2018

Welcome and updates

ISGC Genomic tools

1995-
2001

- Microsatellite-based linkage maps produced through genotyping of the International Mapping Flock

2002

- CHORI-243 BAC library and BAC end sequencing

2006

- Virtual Sheep Genome released

2006-
2009

- INRA 1200-rad RH Panel and genome maps
- USDA 5000-rad RH Panel and genome maps

2007

- Sanger re-sequencing of 2700 loci, 6021 SNPs
- 1536 SNP chip developed

2007-
2008

- Illumina GA sequence (0.8 x) and Roche 454 sequence (3 x) derived from six breeds
- Ovine SNP50 BeadChip

2009

- Ovine HapMap based on 50k SNP chip

2010-
2013

- SNP loci for Parentage
- Resequencing of sheep breed diversity panel and HD SNP chip development (606K SNPs)
- Sheep Genome Assembly OARv3.1 (published in Science 2014)

2015

- Sheep Genome Assembly OARv4.0
- Low density (15K) SNP chip
- SheepGenomes Database (1000 genomes) project initiated

2017

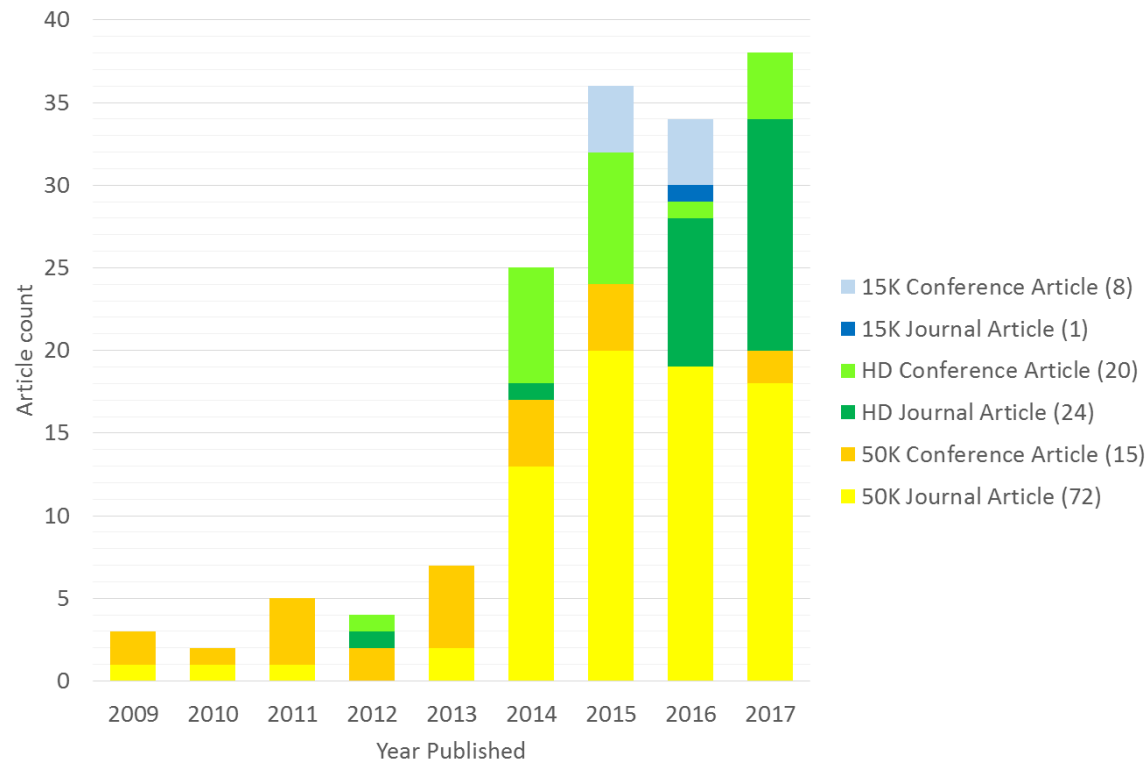
- Ovine FAANG project initiated
- New genome assembly Oar_rambouillet_v1.0 (Baylor)

ISGC Illumina SNP chips

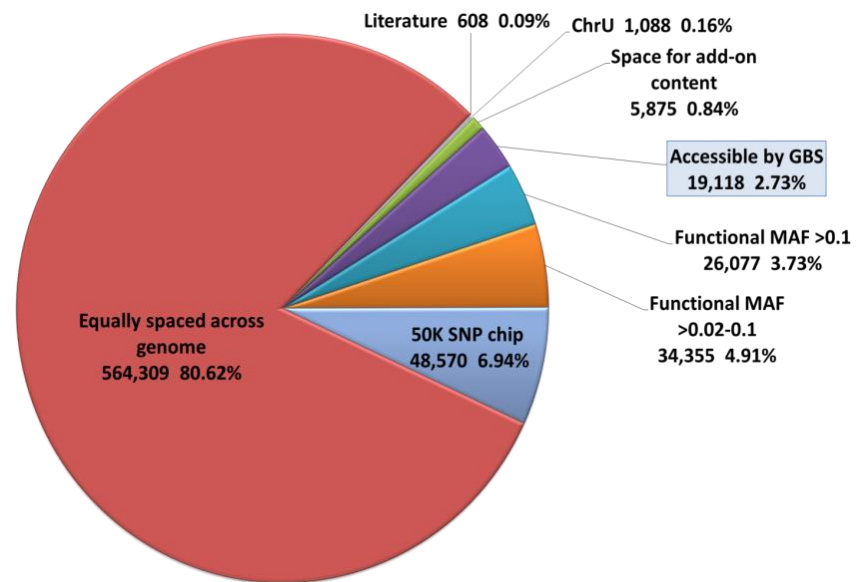
- Both the 50K and the 15K SNP chips are publicly available
- The HD (606K) chip currently remains an ISGC consortium chip



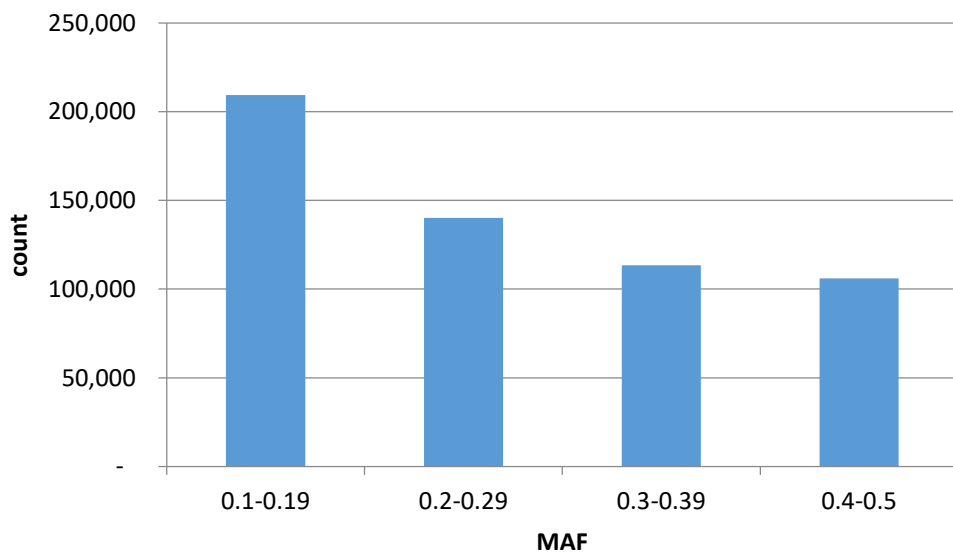
[Various low density ovine chips derived from the ISGC chips by individual groups (AgResearch, CSIRO, Teagasc) to aid genotyping efficacy for genomic selection (\$; imputation)]



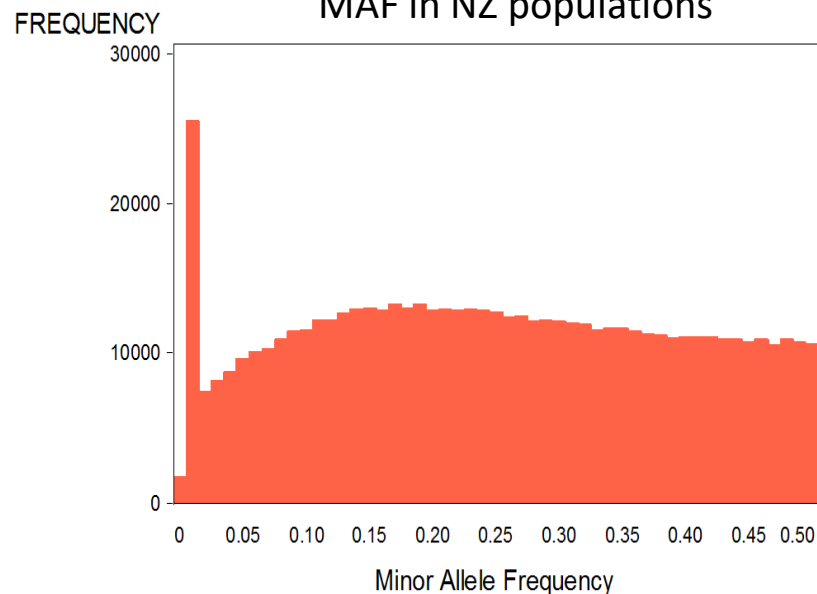
Illumina HD (606K) ISGC consortium chip



MAF bins of the “equal spacing” SNPs

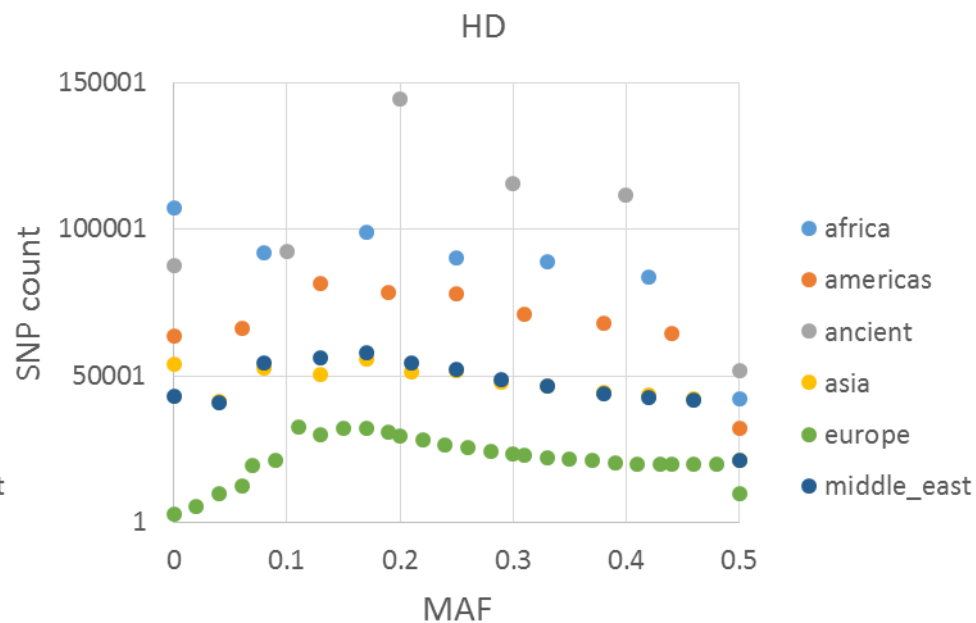
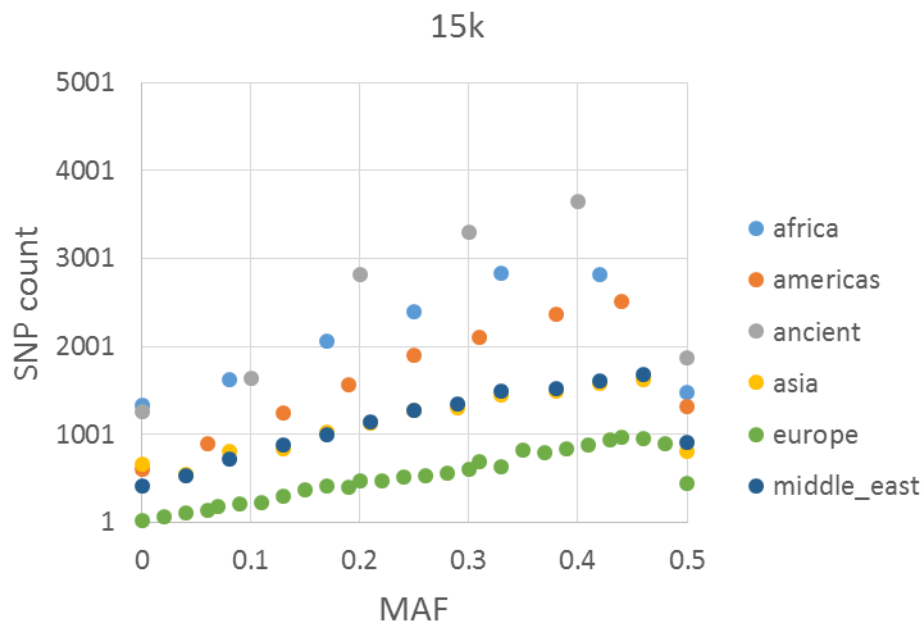
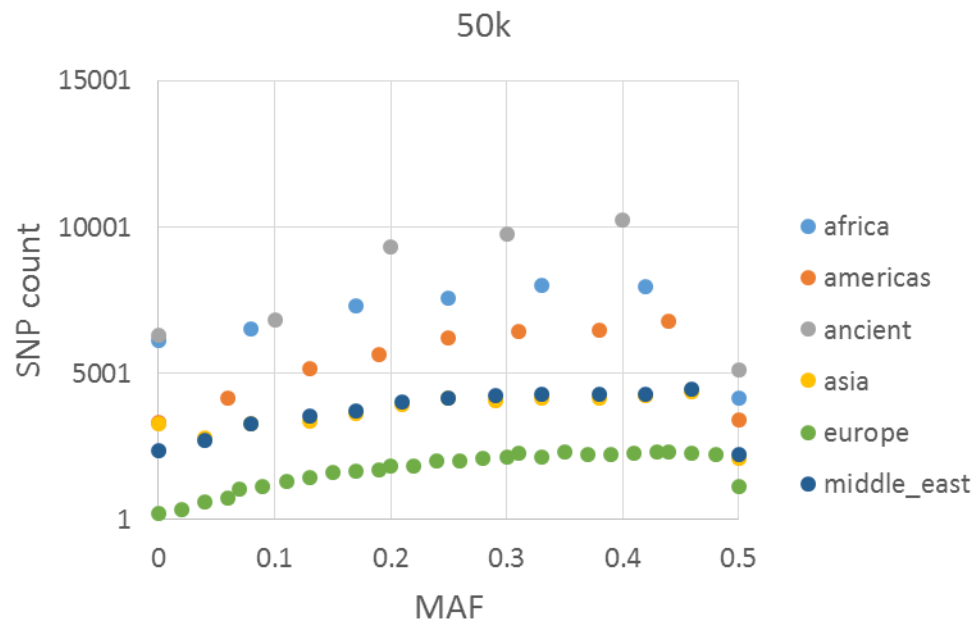


MAF in NZ populations



HapMap animals_maf distribution 15K, 50K and HD chips

location	#animals	#breeds
africa	6	4
americas	8	4
ancient	5	2
asia	12	7
europa	27	20
middle_east	12	7
Grand Total	70	44



Where to next with genotyping tools?



- Research tools vs Industry tools
 - Discovery/association, validation, industry implementation....
- New (Country/group specific) low density/low cost chips in combination with current 50K and/or HD chips ?
 - OR** International effort of a new tweaked version of the 15K but aim to get better price point ?
- Build a new version of 50K chip eg ~40K from current chip with ~10K variants from HD association studies ? Illumina XT 96 sample format?
- Appetite for another International co-ordinated purchase order for current HD SNP chip ? *Better price point.*
- Imputation to whole genome sequence
- Genotyping by sequencing (HD equivalent; simultaneous discovery and genotyping)
- Methylation
- Ovine FAANG

Above just points to ponder!

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Informal follow up at the World Congress on Genetics Applied to Livestock Production,
February 11th-16th 2018, Auckland, New Zealand